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Amstrad plans 16-bit portable



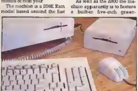
AMSTRAD has begun preliminary work on a new 16-bit portable computer, likely to be launched in the first months of next year

The machine is a 256K Ram model based around the fast 16-bit version of the Z80 processor the Z800, and could offer a degree of IBM PC software compatibility

As well as the Z800 the machine apparently is to feature a built-in five-inch green-screen monitor, 3 inch Hitachi-format disc drive, modem and communications software

An Amstrad spokeswoman, however, denied that the

continued on page 5 ▶



Amstrad has settled on pricing for its CPC 6128 disc-based micros, to be launched in the UK later this year.

The 6128 with monochrome monitor will be priced at £299.99 while the colour display version will cost £399.99.

The prices of the equivalent 664 models will be reduced accordingly in September to £199 and £299

SOMEBODY'S *Living in my Computer is the first personalised computer program – for the Commodore 64*

Not a game exactly, it features a computer 'companion' who walks around, eats plays the piano, watches TV, listens to records and generally acts like a human being

You can type messages to your companion, pet it, and get messages back It will also 'speak' back in a language of bleeps and whistles

Each companion will act differently and Activision says each disc will contain a unique character

The title available only on disc will be out next month priced at £14.99

AMIGA SPECIAL FEATURE ISSUE

- News: Amiga's US launch
- Preview: How the Amiga matches up to Atari's ST
- Profile: Metacomco – UK authors of the Amiga firmware

Acorn deal saves new BBC micros

ACORN has been saved from liquidation by a complex financial restructuring operation which increases Olivetti's stake in the troubled Cambridge micro manufacturer to 78.9%

The agreement reached last week – the second rescue package this year – means that Acorn subsidiaries Acornsoft and Acorn Video are now unlikely to be sold off to raise cash.

Acornsoft has also been freed from its exclusive commitment to Acorn micro compatible software and is to produce a range of titles for other micros.

The company has also announced that it will continue to introduce new BBC microcomputer models, within a timescale now agreed by the BBC and Acorn Development is apparently to continue with

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INSIDE ❭ FRANKIE SAYS "WELCOME TO THE SPECTRUM" SEE P9

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Vol 4 No 30



Amiga offering: Commodore's new micro

EDITORIAL

Acorn's chairman Alex Reid is confident that this second rescue package for the company will be successful

Let us hope so both for the sake of the very large number of people who have bought BBC and Electron machines and also for the long-term future of home computing in this country

It is fundamentally important that the home-grown micro companies which have risen to prominence over the last five years – Acorn Sinclair and Amstrad – survive

The UK companies have a very different perspective from their American counterparts like Commodore and Apple

The Americans have a far higher buying power than the majority of British consumers Where we have the Spectrum and Commodore 64 as the main home micros they have the C64 but also the Apple II and even the IBM PC The top whack for a big selling home micro over here is probably £400 In the US it is more than double that Who in this country would call the Macintosh a home micro? Not many, but in the US they do

This difference in disposable income is the reason why all software in the US is on disc and here cassette programs dominate Sales of disc drives in the UK are very low as a proportion of micros sold

And this is why our own micro manufacturers must survive Many of the new micros being developed by the big US manufacturers are now too expensive to be regarded as true home micros in this country Commodore's impressive Amiga machine launched last week should be a top-selling home micro It will be in America I have no doubt But over here it looks like a high-priced disc-based system At around £900 it will only sell to a small proportion of the potential market.

Atari is showing it has the right idea by announcing a cut-down version of its 512ST – the 260ST – for the UK But I would hate to have to rely on the big American manufacturers making concessions to the UK market.

Much better to have our own companies like Sinclair Acorn and Amstrad for whom the UK market is necessarily a more important consideration when designing and planning new products

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Computer Trade Association Magazine of the Year

Amiga launched in US

COMMODORE'S much feted Amiga machine was launched last week at the Lincoln Centre in new York

Over 800 people attended the launch including artist Andy Warhol who was called upon to demonstrate the micro's impressive graphics capabilities

The Amiga will cost $1295 (about £925) in the US and is expected to reach the shops there this September

The package will comprise the keyboard, single 3½inch disc drive and mouse The hi-res colour monitor is an extra at $495 (£350)

No software is being bundled with the machine, apart from Microsoft's version of Basic, although Commodore is hoping that by the time the micro is released, there will be between 30 and 40 titles available

These include business suites from Chang Laboratories and Software Group, graphics programs from Island Graphics, music packages from Cherry Lane Technologies, programming utilities from Lattice and Metacomco and at least 30 entertainment packages from Electronic Arts, Mindscape, Broderbund, Synapse, SubLogic and Infocom Well known titles include *One on One Skyfox, Sargon III, Chess Sub Logic Flight Simulator* and the complete Infocom range including *Hitch Hikers Guide to the Galaxy.*

The IBM emulator disc is also expected to be available in September "The IBM emulator will be under $100, and there will also be an accelerator available for under $100 which means that software such as *Lotus 1-2-3-* will run just as fast as it does on the PC Without the accelerator the PC software does run slower," said a spokesman for Commodore US

There is still no firm date being given for the Amiga's arrival in the UK Commodore will be concentrating on



the C128 at the *Personal Computer World* Show in September, and the nearest that Commodore UK will commit itself is the first quarter of next year.

Acorn deal

◄ continued from page 1

Acorn's Model B compatible W65SC816-based 16-bit BBC model.

In return the BBC has agreed to reduce royalty payments on its machines but according to Acorn chairman, Alex Reid, this is unlikely to be reflected in a price cut on either the BBC or BBC Plus Most of Acorn s effort is now going into the BBC B-Plus model "The main emphasis is now on the BBC-Plus," confirmed Alex Reid.

Olivetti has agreed to invest a further £4m in Acorn, the BBC has agreed to write off some £2m in unpaid royalties on the BBC micro and Acorn's remaining main creditors will write off £7 9m – about half of the money they are owed. In return they will receive an immediate payment of £8 4m and £4.4m of loan stock.

"The financial position of Acorn is now stable," commented Olivetti's Alex Uboldi He blamed a drop in sales between April to June that was greater than the 40% Acorn foresaw for Acorn's second crisis and share price suspension "The cash injection was needed for the immediate survival of Acorn "

"Development of Acorn's new products has not been affected by the problems "The first new product – the Acorn-Cambridge 32-bit workstation – is to be launched in August.

Commented Alex Reid "The core projects are fully funded and are going ahead.

"At a creditors meeting we put to the creditors a projection of the penny-in-the-pound rate they would get under receivership Acorn would have gone into receivership if any of the parties had not gone along with this deal

"Acorn is now stripped of the problems of the past – we now simply have the problems of the present and the future "

Hermann Hauser – Acorn's co-founder with Chris Curry commented, "it has been a very sobering experience to fly very high one year and very low the next Under the restructuring deal Curry and Hauser retain a joint shareholding of 14 5% "It is sad to see we had to reduce our overheads in the way we did." Acorn has reduced its work-force from 481 in February to 275 Also, the consumer and education divisions have now been merged into one

Acorn is expected to go ahead with sales of its stakes in two separate ventures – Torus Systems and IQ Bio.

Acorn also now formally announced the appointment of Brian Long as its new managing director (see *Popular Computing Weekly*, July 25)

Acorn previews 32016 processor at Barbican

THE THIRD Official *Acorn User* Exhibition took place at the Barbican, London last week

Acorn showed the BBC B Plus, and previewed the 32016 second processor for the first time The 32016 add-on effectively turns the BBC into a 256K, 32-bit machine and is being aimed at scientific and research establishments, with a four-figure price tag

It is to be launched at the end of August at the same time as the postponed Cambridge workstations

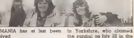
Revs and *Elite* the latter in its more colourful second processor version were the star attractions on Acornsoft's stand.

Acorn also included a computer satellite project developed by a team of pupils from Clifton College, Bristol The boys have been using a BBC micro to track and decode colour weather pictures from Meteostat II

Musical demonstrations were being given on the Music 500 system, shown on Arias Computers' stand, UMusic's UMI-2B 16-track Midi sequencer, FSoft's *Music maker*, and *The Music System*, from System Software

There were also a number of robotics products on display, notably Intergalactic's Zero 2, and Beasty from Microbotics

Pimania's sundial won at last



PIMANIA has at last been solved

The search for the golden sundial of Pi, the object of Automata's adventure game *Pimania*, had been claimed to be the longest running adventure quest in history

The winners are Sue Cooper and Lizi Newman of Ilkley in Yorkshire, who claimed the sundial on July 22 in the horse's mouth of the chalk horse at Hindover Hill, Sussex

A printed booklet of the solution to *Pimania*, is being prepared and will be available from Automata, PO Box 78, Portsmouth for £1 00

Sinclair gets new chief

SINCLAIR RESEARCH's new chief executive will be Bill Jeffrey, 40, who was previously managing director for the company's TV and Communications division.

Bill Jeffrey joined Sinclair in March 1985 from Mars Electronics where he was responsible for sales, marketing and R and D for the company's radar and navigational products

His promotion to chief executive is seen as a direct result of his success in bringing the flat screen TV to the market.

As yet, no successor to the post of TV and Communications managing director has been appointed.

● The price of the QL is now being cut in some high street chain stores The HMV shops are selling the machine at £275 and the John Lewis Partnership at £299.

"Our cut is a consequence of our 'never knowingly undersold' policy", said Gerald Whiting of John Lewis "We are simply responding to other retailers who are perhaps overstocked."

New deal on Atari 130XE

ATARI'S 130XE is now being offered in a special value pack including a data recorder by some retail chains

Boots is selling the bundle at £149.95 whilst Dixons and Curry's has it at £149.99 but adds the *Introduction To Basic Programming* tape

Amstrad portable

◄ continued from page 1

company has any plans to develop a portable

The Z800 is a new chip from Zilog – makers of the Z80 used in all previous Amstrad micros – which is likely to be available in the first quarter of 1986 The first Z800 chips produced will be low-power consumption CMOS devices, ideal for use in a portable

The Z800 is software compatible with the Z80 so existing software on disc for the CPC664 and 6128 could be made to run on the machine

It is also likely that the new portable will be IBM PC compatible Amstrad is thought to have licensed DOS-Plus a new software product from Digital Research, from whom Amstrad has already licensed the CP/M disc operating system used by the CPC models.

Digital Research has announced that it has signed a deal to supply the DOS-Plus operating system to one unnamed UK manufacturer

DOS-Plus effectively emmulates with software the 8088 processor used by the IBM PC enabling PC-DOS 2 1 programs to be run.

Using such an arrangement the Amstrad portable would be able to run – albeit possibly a little slower than the IBM PC – any of the huge catalogue of business packages so far developed for the IBM.

Another advantage of DOS-Plus for Amstrad is it is compact – only 64K – and therefore can be implemented on a built-in Rom for the portable

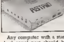
Chris Hall of Locomotive, the systems house which wrote the Basic and operating systems for the Z80-based Amstrad micros denied knowledge of any Z800-based micro "I don't know everything they do I have never seen a real Z800 chip but it would certainly be of interest to anyone with a lot of Z80 code "

An Amstrad spokeswoman said "We have no plans to launch a portable micro and there is no portable in development."

Satellite data for micros

ASTRID is a consumer satellite receiver produced by MM Microwave of York.

For just £149, ASTRID (Automatic Satellite Telemetry Receiver and Information Decoder) will enable you to receive data transmitted by the UOSAT satellites, record it on a cassette tape and display the information on your home computer screen.



Any computer with a standard serial port should be able to use ASTRID.

Further, software is available from AMSAT UK for graphic display of satellite tracks error correction of received data, and storage on disc. AMSAT UK is at 94, Herongate Road, Wanstead Park, London E12 5EQ.

Further details on ASTRID from MM Microwave, Satellite group, Thornton Road Industrial Estate, Pickering, N Yorks (0751 75455).

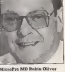
Wordstar launched for Amstrads

MICROPRO, the business software company has announced that it is to launch its best selling *Wordstar* word processor package on the Amstrad 464 and 664 machines.

The Amstrad version will be called *Pocket Wordstar* and will retail at £149, some £150 cheaper than the full version in its basic form.

"*Pocket Wordstar* is not very different from the original. Some of the block moves are restricted in size because of memory available, but that is about all," said Robin Oliver, MicroPro's managing director.

"We are also looking at the Atari ST, C128 and Amiga for possible implementations of *WordStar*, and of course, *Pocket WordStar* should run on the Amstrad 6128. I think that Amstrad users are the group who would benefit most from a genuine business package being made available for their micro."



MicroPro MD Robin Oliver

Costs of QL program duplication go up

DUPLICATION charges for Sinclair QL titles are going up this week.

Previously Sinclair paid the duplication charges at Ablex Audio Video so that the customer paid only for the blank cartridge themselves.

From August 1, repeat duplication orders will carry a recording charge of 30 pence per cartridge.

First runs of programs, however, will continue to be subsidised by Sinclair.

Ablex hopes that its prices may soon drop sharply – the company is changing its duplication methods and the recording charge may then come down to below 10 pence per cartridge.

Letters

Pimania

There is a 'bug' in the *Hackers* cartoon's (July 25 issue) reference book, as well as in the computer program.

Pi begins 3.1415, not 3.1417. It doesn't even round up to 3.1417. Coincidentally, the 200 millionth place is also a five.

Pythagoras
The Mother Honeywell
Foundation of
Supernal Light

OK. I can't see how to get out of this. We wuz wrong.

Are you sure about the 200 millionth decimal place?

Status Quo

The article by Boris Allan on the future of languages (July 18 issue) was very interesting but my view of the future is more pragmatic. New languages are always of interest but it seems that Basic is here to stay.

We all start with Basic because nearly every micro/mini come with a version of Basic built-in. Who wants to program in some other language when the rest of the world is banging away in Basic? The aristocrats amongst us soon tire of this and graduate to machine-code. Which came first, the chicken or the egg?

Because beginners use Basic, new computers will continue to be provided with this high-level language and it will be expanded as new facilities become available via the hardware, in the same way that Basic always has. The intricacies of Fortran, Cobol and the like, will remain the province of the professional programmer, whilst Logo will remain in the educational world.

Larger memories, 32-bit operation, the removal of the "von-Neumann bottleneck", none of this will alter the status quo. Basic will survive, albeit in a much modified form.

But since the days of naff commercial programs are numbered, if not over, the majority of computer users will be buying ready-made software for use with the new generation machines.

Ian R Higton
23 Eagle Court
London E11

Cat problem

I think the following information may help with the problem of identifying what type of file has been saved to a ZX microdrive cartridge.

The problem arises when you *Cat* the microdrive. The *Cat* does not tell you what type of file(s) they are. Either

a) Program file,
b) DATA file,
c) SCREEN$ file,
d) a CODE file.

While I was fiddling with *Saving* a file in different colours I noticed that I could *Save* programs and files with all sorts of colours. Of course the file name should not exceed more than 10 bytes. If while *Saving* a file you restrict the actual name to 8 characters and the next 2 bytes to either one of the following, DATA, CODE, or SCREEN$. Either:

```
SAVE*"M",1 "namexxxx
DATA" DATA()
```

where DATA in the quote marks is extended mode D,

```
SAVE*"M",1,"namexxxx
SCREEN$"SCREEN$
```

where SCREEN$ in the quote marks is extended mode / symbol shift K,

```
SAVE*"M",1 "namexxxx
CODE"CODE Address,
length
```

where CODE in the quote marks is extended mode I.

Then when you do a *Cat* the following information is displayed

Cartridge name
namexxxxxx if a program
namexxxxDATA if a data file
namexxxxSCREEN$ if a Screen
namexxxxCODE if machine code

Of course when *Loading* a file cartridge you have to go through the same procedure except you use *Load* instead of *Save*.

Omer Coruk
44 Rossmore Court
Park Road
London NW1



Well trained

Program *Southern Belle* **Micro** Spectrum 48K **Price** £7 95 **Supplier** Hewson Consultants 56B Milton Trading Estate Milton, Abingdon, Oxfordshire OX14 4RX

It was once every boy's dream to grow up to be a train driver (I'm afraid these were the dark ages of sexist role stereotyping) but the closest most got was their Hornby 00 gauge loco *Southern Belle* provides a chance to fire up the old Spectrum and take part in running the pride of the Southern Railway from Victoria to Brighton.

With flight simulators I always found the hardest part was landing This time I crashed into the buffers at 30 mph! It may come as a surprise that controlling the brute force of the iron horse takes every bit as much sensitivity as it does to land a light aircraft

With the threat of lateness at one extreme and running out of coal or water at the other, you've got your hands full Luckily there's a host of options, with the computer taking control of all but three of the controls at the easiest level

Different runs range from trainers to problem ones with stop signals, speed restrictions and other random hazards You can even challenge the line record.

The line drawn perspective landscape moves pleasingly by your cab view with all the important landmarks recognisable and the piston and whistle sounds almost compensate for the lack of grease and grime If you've not got an hour or more to devote to the journey there's a speed option but I suspect that this novel simulation will seduce a good number of people to spend their evenings guiding the six o'clock Bank Holiday special to the coast

John Minson

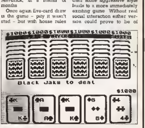
Aces high

Program *Poker* **Micro** Spectrum **Price** £5 95 **Supplier** Duckworth, The Old Piano Factory, 43 Gloucester Crescent, London NW1 7DY

At last software houses seem to have realised that there's no need for the sales gimmick of 'Sexy Mandy' erotically peeling away her pixels to sell poker games This is the second serious attempt, after CCS's *Maverick*, in a matter of months

Once again five-card draw is the game – pity it wasn't stud – but with house rules such as raises in $8 units only Your six opponents, from Billy the Kid to Doc Holliday, add to the Wild West saloon atmosphere, and make comments, scowl and even finger their guns though the game stops short of an arcade shoot 'em up sequence Then there's Moll Though she remains strictly in the lo-res of the imagination she helps out by serving drinks and offering advice on whether to raise, stay or fold

In poker winning isn't just the main thing – it's the only thing! A program like this is a cheaper way to practise the basics than having a school of experts lighten your bank roll. Shuffling and dealing is rather slow, and I suspect that your opponents aren't quite as sophisticated in their plays as those of *Maverick*, though their more aggressive style leads to a more immediately exciting game Without real social interaction either version could prove to be of



limited addictiveness, but if you see yourself as an apprentice cardsharp this is a reasonable attempt at the game

John Minson

Get in line

Program *Azimuth Alignment System* **Micro** Commodore 64 **Price** £4 95 **Supplier** Challenge Research, 218 High Street, Potters Bar Herts EN 6 5BJ

This may be the best fiver that you ever spend on your micro Everyone will have experienced that intense frustration when a favourite game refuses to load Usually this is caused by faulty alignment of the tape heads on your cassette deck, and can be easily corrected using the *Azimuth Alignment System*

Why you may ask, do some programs load but not others? Many tapes particularly those saved from listings, transfer information at standard speed (300 baud) Usually these programs cause few problems, even if the tape heads are not set accurately However, it's when it comes to the new high-tech, turbo-load, data compacted programs which need to transfer information at 3000 baud that troubles start. Quite simply, if the tape head is not positioned exactly perpendicular to the direction of tape travel, the shorter pulses in a novaload program will merge together and corrupt the signal.

In case you are wondering what azimuth means, according to my dictionary it refers to an arc of the celestial circle, usually the bit between the zenith and the horizon. This gives a clue as to how the *Alignment System* works

Having first loaded Side A, the test signal is then found on Side B of the tape By inputting the signal, screen border colour will change to indicate the state of head alignment. By adjusting a small screw, two extreme positions can be found Bisecting the angle between these positions gives an exact setting

My only grumble is that some guidance could have been given on just how to bisect the extreme angle Guessing isn't good enough

If you've got more than one tape that will not load, rush out and buy the Azimuth Alignment System It will pay for itself in minutes, and is cheaper than its competitors

Tom Bassey



Pot black

Program *Alex Higgins' World Pool* **Micro** Amstrad **Price** £8.95 **Supplier** Amsoft, Brentwood House, 169 King's Road, Brentwood, Essex, CM14 4EF

The continuing saga of the Amstrad snooker games has begun to match *Dynasty* in its convolutions The story briefly to date was the Amsoft's *Snooker* game had some very nice touches such as numbered balls for green screen owners, attractive detailing, etc, but was slow and less playable compared to the rival *Steve Davis Snooker* and also cost a pound more – no contest in most people's minds As an attempt to get round this Amsoft have re-released their old game with an improvement in the coding to make it faster, and with the added attraction of carrying a licence deal with Steve's arch rival Hurricane Higgins (which I'm sure did little towards making them able to consider a price cut as well) If there is anyone left who hasn't got one or the other it may be worth a look.

Now Amstrad has released *Alex Higgins' World Pool* which stretches the relevance of the licence a bit far but is an enjoyable release

Unlike most versions of computer pool this actually has the full number of balls and plays to the correct rules – the attention to detail even stretches to the point where half the balls carry spots and half stripes and these are animated to move and roll the way the patterns would on a real ball. It is all very clever and probably takes up at least half of the processing time with the result that the game is, once again, slow

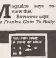
Still if pool is your game rather than snooker it is the most attractive version I have seen, certainly not unplayable and there doesn't seem to be any immediate rivals for your cash

Tony Kendle

Frankie speaks

Program *Frankie Goes To Hollywood* **Micro** Spectrum 48K **Price** £9.95 **Supplier** Ocean Software, Ocean House, 6 Central Street, Manchester M2 5NS

Magazine says review this! Reviewer says I hate *Frankie Goes To Hollywood* (the 7 inch, the 12 inch, the megamix, the hype), I think their records are boring and their fans will buy this anyhow grumble, mumble, moan



And suddenly there came a Bang! Reviewer is taken into a corner where a computer warbles a Frankie-ish riff Reviewer, overcome, hurries home with his copy clutched under his arm and the desire to reach the Pleasuredome.

Home is a very ordinary terrace in an ordinary street in an ordinary town. Reviewer wanders from house to house, room to room There's a cat to feed That results in a little pleasure, the feeling of being more of a real person There are video games to play more pleasure, more real And there's a murder with clues aplenty. Sherlock Says Deduce!

This is most definitely *The Power* of Denton Designs Somehow they have crammed a game of dazzling style and complexity into a tiny micro Playing is a true voyage of discovery; not merely objects and how to use them but even your aims! Reviewer ventures ever deeper, stepping into windows which iris out attempting arcade games, becoming more real.

Two Tribes go to war over the fact that this Spectrum version is less good than the Commodore 64 version in sound, graphics and, I suspect, game detail and complexity But *Relax*! It's still the most infuriating and addictive game this year

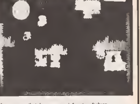
Did I say 'game'? I'm not sure this isn't more real than real life! John (52% real) Says Play It!

John Minson

Rare humour

Program *The Covenant* **Micro** Spectrum 48K **Price** £6.95 **Supplies** PSS, 452 Stoney Stanton Road, Coventry CV8 6DG

I suspect that this successor to *Xavior* will prove something of a classic. It's one of those infuriating games that keep you playing into the early hours.



As sole survivor of your race (wot, again?) you have to venture deep into a vast system of caverns to collect animal life to repopulate the planet Sixty-four sections of caves, each with four screens and its own individual beastie, contain a key and section of a map but first you have to locate and collect the particular anaesthetic that will stun the creature long enough for you to capture it. If not contact causes energy drain and while some power points compensate for this others reduce it further.

None of this is startlingly original but it displays a rare humour, with really cute creatures, strategy as you discover where the objects lie and how best to reach them, and arcade skills as you float about in a bubble which is governed by laws of inertia, gravity, *et al* in a most infuriating fashion.

In addition, later screens contain nasty little surprises such as hiding the anaesthetic behind columns. Loss of lives returns you to the start, but there's a *Save* game feature

A great game with one big problem – one of the worst hyper loads I've encountered. I prefer the challenge of playing the game to the frustration of loading it

John Minson

West country amigos

With Commodore's Amiga micro now launched, Metacomco – which wrote much of the operating system for the machine – is systems house of the moment ***Christine Erskine*** *investigates*

There can't be too many connections between St Paul's in Bristol, which achieved some notoriety in the summer of 1982, and Monterey in California, whose heyday was the late 60s and all that stood for in fact, there's probably only one – Metacomco

As a small company which up to now has hardly been involved in the glamorous side of home computing – *QL Assembler* and *QL BCPL* being two of its well-received packages – Metacomco has made the sort of shrewd moves hardly ever seen in the industry

Last February Metacomco signed the contract to write the operating system for the new Commodore-Amiga 68000-based micro

Quite how Metacomco – whose Monterey branch is fairly tiny – managed to leave the rest of the US giants gnashing their teeth at the starting blocks on this deal remains a mystery even to Metacomco

"Some Amiga people came to our stand at Las Vegas Consumer Electronics Show in 1984, and asked if we did anything on operating systems," said Peter Mackeonis, Metacomco's marketing manager "Four months later they rang us up and asked for a list of our ideas for a new machine."

Metacomco was only awarded the contract six months ago, so it has been frantic work to get the operating system, AmigaDos, ready for the machine's US launch last week.

The company probably had a head start on other contenders for the deal in that Metacomco already owned an operating system – Tripos – which in many ways was suited to the Amiga. Tripos, originally developed at Cambridge University in the late 1980s, is a single user multi-tasking system.

"We developed a number of languages to run under Tripos which we then had to convert in various forms for the QL, and now the ST and Amiga," said Peter

"While our AmigaDos is certainly adapted from Tripos, we have had to do a lot of modifications to make it acceptable for a modern system," added Pam Clare, Metacomco's technical manager

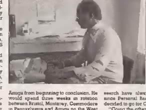
"We've obviously had to customise it to make the best use of the Amiga's graphics and sound capabilities – getting it to address the Amiga's custom chips has been the major modification

"There were also a very large number of specific requirements from Commodore," Pam continued. "For instance, under Tripos, you have to specifically boot each disc as it is inserted Commodore wanted discs to be both instantly recognised and booted."

"We're very pleased with the end product," Peter added "We see AmigaDos as a pre-Unix system – having adapted Tripos into AmigaDos, we now intend to carry on adapting it and licensing it for other machines It's certainly a strong contender for the 'windows market' As yet there is no standard operating system for the 68000 chip, so it would be good if we can get Tripos going now

"I think the feature I particularly like about it is the 'no restrictions' idea You can have any number of directories, any number of files within them, the number is only governed by the amount of memory you buy " AmigaDos uses just 28K of code, and was originally written in BCPL, before being assembled, which, says Peter Mackeonis "kept it very tight"

That the last six months has been hectic is exemplified by the lifestyle of Tim King, who oversaw Operation Amiga from beginning to conclusion. He would spend three weeks in rotation between Bristol, Monterey, Commodore in Pennsylvania and Amiga on the West Coast But Metacomco's work for the Amiga does not stop at its operating system It has also implemented three languages for the machine – Basic, Pascal and Lisp



"Our 8086 – based Basic interpreter, which was released as Personal Basic, was Metacomco's very first product, four years ago," said Peter "We licensed it to Digital Research for $600,000 (about £600,000) and they in turn implemented it for the 68000 chip and licensed it to Atari for the ST "

Indeed, until Metacomco's range of languages for the QL came out, 85% of its work had been as an OEM (original equipment manufacturer) Languages such as its Pascal and C have been sold widely to universities for use on development micros such as the Sage series Normally, these products would cost around £300-£500, so paring away the price to make it suitable for QL, ST and potential Amiga owners has been something of a challenge

Even so, a Metacomco language (so far, QL Assembler, QL BCPL, QL Lisp and QL Pascal have appeared) does not come cheap – around £80 for QL Pascal – but it is a comprehensive and sophisticated version.

The QL languages were Metacomco's first releases to be sold directly to the end user – how have they fared?

"We've sold 7,500 QL language packages altogether," said Peter "That's around 15% of the market, so it's quite respectable Obviously we'd be happier if the QL had lived up to expectations and sold a lot more "

Amiga Pascal is a particularly powerful version, MCC Pascal 68000, a complete ANSI/IEEE standard 770X3.97 (ISO 7185) compiler, which means we're talking big guns here The Lisp is not the standard variety, but the Cambridge Lisp dialect Commodore-Amiga will be badge marketing the languages itself.

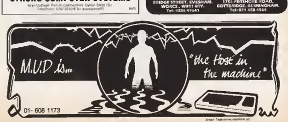
While the languages are not being bundled with the machine, Metacomco's 68000 development tools – macro assembler, linker and editor – will, like the operating system itself, reside inside the micro as standard

With the company's specialisation on 68000 systems, the Apple Macintosh looks strangely neglected and out in the cold, "Yes, I know, it is the odd one out," said Peter "We've looked at the Mac and decided no Our links with Digital Research have always been very close since Personal Basic days, and so we decided to go for Gem instead

"Going the other way around though, we have been talking to a European development company which wants to port its Macintosh softwars over to the Ataris "

Metacomco could probably allow itself time now to sit back on its laurels as writer of AmigaDos. However, it has taken a stand at the *Personal Computer World Show* in September, where it will be launching a C compiler for the QL, and 'fingers crossed', the first of the Atari ST packages

"I would like to see Metacomco become a major force in the market place, the new Digital Research, if you like, but home-grown," was Peter Mackeonis's parting shot



M.U.D is...
"the Host in the machine"
01- 608 1173

Commodore's turbo Portia

Andrew Pennell takes a look at Commodore's exciting Amiga micro – and finds out how it compares with Atari's ST rival

While much has been made in the press of the forthcoming Atari ST range of micros, little has been heard of its main contender-to-be, the Commodore Amiga.

The Amiga too would seem to offer a Macintosh-like windows-icons-mouse-controlled operating system, but with two major improvements – multi-tasking, and amazing graphics abilities. The machine will be more expensive though – at around £1000 for the basic console and disc unit – but without a monitor.

The Amiga has had a chequered history – originally Atari commissioned a company called Amiga to design some graphics chips for their Lorraine machine. After some disagreements, Amiga returned Atari's money, and Commodore then bought the company and also the rights to the machine, now known as the Amiga.

The design philosophy of the machine seems simple – build the most amazing graphics chips and, almost as an afterthought, put a microprocessor and keyboard on it. The result is the most sophisticated graphics system yet seen on any micro, which puts many dedicated arcade machines to shame. In addition the operating system placed on top of the hardware is a windows-icons control environment, with one major advance over the Mac and ST – multi-tasking.

Hardware

The machine itself is based around a 68000 processor, the most fashionable chip at the moment.

To get the most from the processor, there are also three very special custom chips, and a few standard ones, along with 256K of Ram and 128K (192K possible) of Rom. The three custom chips are Agnus, Portia, and Daphne – much more interesting names than those like ZX8302 used on the QL, and much more sophisticated too.

Agnus is a general memory controller, complete with 25 direct memory access channels, a bit-image manipulator (the Blitter), and a powerful co-processor (called Copper) whose job it is to look after the screen. The large number of direct memory access channels means that operations involving peripherals such as sound and disc operations are very fast, as the 68000 processor just has to tell the chip to do the transfer, then it can do something else while the direct memory access channel does the input/output routine. The 'Blitter' is used for moving and setting blocks of memory much faster than the processor could do, and not just continuous blocks of memory. Given, say, a rectangle on the screen, the Blitter will move it to another area on the screen. It can also draw straight lines and fill areas, so needless to say, this offers amazing possibilities for windows and animation, exploited by the Rom. The Copper co-processor is responsible for the display – where its sections are in memory, what modes they are in, and the sprites, covered in detail later.

The Portia chip controls all input output operations, including four audio channels configured as a double-channel stereo sound, and game controller inputs, which can be mouse, trackball, analogue joystick, and switched joystick, actual disc I/O, and the complex interrupt controls.

Portia is linked directly to Agnus to allow fast direct memory access, while the third custom chip, Daphne, is the custom animation device. It combines all the signals from Agnus, then adds its own for things such as colour control, sprite priority and collision detection to actually produce a display on the TV monitor. The sound information is stored as a digitised waveform which can be sampled and manipulated – much as a sophisticated synthesiser/sound sampler works.

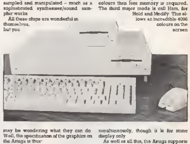
All these chips are wonderful in themselves, but you may be wondering what they can do. Well, the specification of the graphics on the Amiga is thus:

It has a pallette of 4096 colours though the normal limit is a choice from the pallette of 32 on the screen simultaneously. Low resolution mode is 320 pixels by 200 pixels with up to 32 colours. High resolution is 640 pixels by 200 pixels with 16 colours. Using an interlaced mode the vertical resolution can be doubled to 400 pixels, and actual horizontal resolution is greater than the figures given but is not guaranteed to be visible on ordinary screens because of overscan. The number of colours combined with the resolution means that only high-quality colour monitors can satisfactorily be used, and at the moment Commodore themselves do not offer a suitable RGB monitor. However, it is producing one for the 80-column mode of the C128, though whether it will be able to cope with the Amiga graphics is not known.

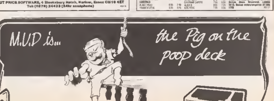
The above spec is pretty good, but there is much more to the Amiga than just this. There are three screen modes called Single Playfield, Dual Playfield, and Hold-and-Modify.

The display can consist of multiple viewports, which are a sort of hardware window. Each viewport can be a different resolution and use different colours, though you cannot stack viewports sideways. Single Playfield mode is like most other machines screen mode, but Dual Playfield is like nothing else – you can have one 'screen' superimposed on top of another completely different one, with holes in it through which you can see the screen behind it.

The high resolution and number of colours does have a drawback though – memory used. A low resolution screen, 320 × 200 with 32 colours consumes about 40K, but a high resolution screen with 16 colours takes 128K, half the Ram on a standard machine. The system is flexible, though, so if you want fewer colours then less memory is required. The third major mode is call Ham, for Hold and Modify. This allows an incredible 4096 colours on the screen simultaneously, though it is for static display only.



As well as all this, the Amiga supports sprites – pixel patterns that can be moved over the screen by the hardware. There are actually eight sprites supported by the hardware on its own, but the software switches between sprites as the display is produced, and allows more to be present, though there is a limit on how many can be shown on one horizontal scan. These sprites are known as VSprites, and are 16 pixels wide, and



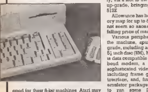
M.U.D is...
the Pig on the poop deck

any number of pixels high. Each pixel in a sprite can be one of three colours, or transparent. If this is a limitation to the programmer, there are other sprites available, known as Blitter Objects, or Bobs. These use the Blitter in conjunction with the system software to put themselves on to the screen and remove them when required, and suffer none of the limitations of VSprites – they can be any size, and any number of colours (subject to the mode of the screen they are in), though they are slower than VSprites because of the software overhead. With both types of sprites there is priority encoding and full collision detection, using both hard- and software. To make the best use of the sprites there are AniMobs and AnimComps, which are a way of allowing automatic animation of shapes across the screen with little programming intervention.

If you require something like a large scrolling map, the hardware can do all the tricky stuff again, as it allows the display of any given area of memory on the screen, anywhere on the display. It does this using things called Rastors, which are a sort of massive sprite, up to 1024 pixels square. To display a part of it, you just have to tell the hardware where your map is, which bit you want displayed, and where you want it, and let it do it all for you.

Basically, the Amiga graphics system is the most revolutionary yet seen on any home micro, and thrashes the competition out of sight.

The previous best was that used on the Atari micros, but the Amiga system is a sort of 16-bit up-date of the old Atari 8-bit system. Strangely the Atari ST range uses nothing of the technology devel-



oped for their 8-bit machines. Atari may yet pay for the lack of foresight.

So much for the graphics hardware – what of the rest of the machine? Well, Commodore has been very secretive with the Amiga (unlike Atari with all the ST hype).

The machine is in two parts, the main console incorporating the disc drive, and the keyboard. The built-in 3½ inch disc drive has the largest capacity yet – 880K formatted. It seems that everyone is going for 3½ inch discs now, with the exception of Amstrad which has lumbered itself with 3 inch discs. It won't be long now before it is the only manufacturer using them, which bodes ill for the users.

I am a great fan of 3½ inch discs – they are small, and tough. The double-sided discs the Amiga uses are pricey at around £6 each, though with demand rising all the time the price should come down.

The keyboard has 89 keys, complete with numeric pad. The keyboard feel is good – to compete with the Mac it should be, though the ST, which is pitched at a similar market slot, suffers from a rather cheaper keyboard.



To communicate with the user, a two-button mouse is used, and supplied as standard. There are various ports on the back of the machine and they show that Commodore has only been able to exert a last minute influence on it: gone at last are the non-standard, slow ports used on other Commodore machines. Instead there is a fast external disc drive port, a parallel printer port, RS232 serial port, twin joystick sockets, and a full system bus socket – which the Atari ST does not have.

There are outputs for stereo sound, which is not put through the TV unlike the C64, as well as the provision internally, via a slot to the front, for a 256K Ram up-grade, bringing the total Ram up to 512K.

Allowance has been made in the memory map for up to 8M of Ram, which may not seem so excessive with the rapidly falling price of memory.

Various peripherals are planned for the machine, apart from the Ram upgrade, including an external 3½ inch and 5¼ inch disc (IBM), Midi music interface (it is data compatible with a Fairlight), 1200 baud modem, a range of printers, a sophisticated video controller package including frame grabber and Genlock interface, and, finally, a $500 software emulator package to enable the Amiga to run some IBM PC compatible packages.

Something that often gets overlooked is processor speed – while the Amiga, ST and QL all run at a theoretical speed of around 8MHz, actual program speed is less than this to allow the hardware access to the screen Ram. The QL suffers badly in this respect, with user programs running three times as slowly as they should.

The Amiga, thanks to its graphics coprocessor and direct memory access channels runs almost at top speed, which should result in some very fast complex software, both for business and games.

Software

The hardware specification is very impressive, but hardware alone does not sell machines (see the old Ataris and the QL). The software makes a difference, and the Amiga firmware is a sort of cross between the user-friendly Macintosh, and the multi-tasking of the QL.

Programs are controlled via 'Intuition', the Amiga's window-icon mouse-operated environment, running on top of AmigaDOS.

Intuition is more than a simple front end (like the ACT F1e's Activity interface). Instead, like Gem on the ST, it is a complete multi-tasking, window environment, designed to make the best use of the machine's graphics abilities. It uses windows in a similar way to the Mac and Gem, with a title bar at the top, scroll bars along the bottom and side, and a close box. The way you arrange windows is a little different, with small 'bring to front' and 'send to back' icons.

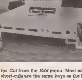
As 'Intuition' is multi-tasking this is important. Since more than one program can run at once and each program can have one or more windows, switching between windows is very necessary. As they are proper windows (ie, when you uncover one its contents re-appear) its multi-tasking is much more practical than that used on the QL, which has simple windowing. As there is only one keyboard, whatever you type is passed only to the program that owns the frontmost window, and a program that is running 'behind' it will not know you pressed a key.

Another difference between Intuition and the way the Mac and Gem work is in menus. The latter machines have menu bars across the top of the screen, but this is impractical for multi-tasking. Instead, Intuition does menus in a similar way to the original method conceived by Xerox. By pressing the Menu button on the mouse when over a window, the top of

the window changes into a menu bar, from which you make a selection by clicking in the Gem way.

An improvement over its predecessors is that menus can have up to three levels – when you select something you may get another menu, and if you select something in that one you may get a further one. This too has been borrowed from the original work at Xerox – responsible for the whole windows-icons idea – and can be very useful indeed. The Amiga allows keyboard short-cuts for menu items in a similar way to the Mac, but Gem strangely does not.

For example, using the Commodore key in conjunction with 'X' is a shortcut



for *Cut* from the *Edit* menu. Most of the short-cuts are the same keys as the Mac too. Intuition seems, on paper at least, to be the best windowing icon-based environment yet on any machine.

Few entertainment software programs will bother with Intuition, as it places certain restrictions on what can be done graphically, and the advantages of an icon based system usually are not required for most games anyway. Games will probably by-pass Intuition and use the low-level routines in the Rom to get amazing on-screen effects. If a game is written firstly for the Amiga, any conversions on to other machines will be difficult as nothing else comes close as far as its display abilities.

The Amiga machine has been under development for several years. The time taken for development usually reflects in the operating system. (The Mac took around four years to design, and the Rom was so good that there has so far only been one version.)

In contrast, the QL was done pretty quickly with several versions of Rom, while the Atari ST was literally knocked together in a matter of months.

Now the Amiga hardware and most of Intuition is finished, Commodore is racing with Atari to see who finishes first. In the US to begin with – for the first few months – the Amiga Rom will have to be soft-loaded from disc, as with the Atari ST, before Commodore will commit itself to Rom.

Where both the Amiga and ST suffer is in the lack of language or applications software. Neither have a finished Basic yet, the only software the Atari has is *GemWrite* and *GemPaint*, while the Amiga has just *TextCraft*, a word processor. The success of machines now depends heavily on the software support that can be generated for it.

Commodore plans word processor, graphics, speech synthesis, music and spreadsheets packages to be ready for the Amiga before it goes on sale.

Both Atari and Commodore have realised the importance of development software, and supply to software houses most of the tools that are required. Interestingly, all the Amiga development software (except the C compiler from Lattice) is written by Bristol-based Metacomco, known for their QL software. It has developed AmigaDOS from its existing TripOS system and Lisp and Pascal languages, a macro assembler, linker and editor package have also been developed by the company for the Amiga.

The Basic to be bundled with the Amiga is apparently to be Microsoft Basic.

Conclusions

The Amiga is aimed at the upper end of the home market and the lower end of the business market.

For the home market it has the best games potential of any machine ever. It's just a shame Commodore don't release a cut-down version without discs but with cassette port, which would be the best chance of getting into the British home market.

In the business market its main rivals are the Atari ST and the Apple Mac. The ST is cheaper, and you get more Ram, but Intuition seems preferable to Gem. The Mac is much more expensive, you get less Ram, and no colour, but it does now have a large business and language software base. Rumours of a cheap colour version of the Mac have been around since its launch, though September is the current date for the colour Mac's release. If the UK launch of the Amiga is in January as planned then the first machines over here should have the system software in Rom.

By then there will be a few more machines on the market at the same price but the chances of them being superior to the Amiga are slim.

Its main drawback is price. The basic machine – console keyboard and disc drive – will sell for $1295 in the US. That could translate to a UK price of somewhere just under £1000. Add in a monitor and the price goes up to nearer £1300 for a 256K machine.

Its main obvious rival, Atari's ST, is substantially cheaper. The 256K ST with disc and monitor could be as little as £650 and the 512K equivalent is £800.

Even an entry level price of just under £1000 for the Amiga is enough to ensure that, in the UK, the machine will not be a true mass market home machine. (The situation in the US, where the machine will find its main market, is rather different, with Macs, Apple IIs and IBM PC's being the main home micros.)

Nevertheless, the Amiga is technically a very exciting micro. Its graphics potential alone makes it a fascinating machine to use. If you can afford it – buy it.

Amiga Specification

Processor:	68000
Ram	256K (expandable with expansion board to 512K)
Rom	128K (192K possible)
Custom chips	Agnus – memory management and graphics (handled by built-in co-processor)
	Portia – input/output handling (mouse, discs, and sound)
	Daphne – animation – sprites, colour control
Operating system.	Windows/icons mouse-controlled environment termed Intuition and AmigaDOS
Built-in language	Microsoft Basic
Graphics	60 or 80 column text
	Low resolution 320 × 200 pixels graphics in 32 colours
	High resolution 640 × 200 pixels graphics in 16 colours
	Colours chosen from pallette of 4096 shades
Sound.	Four channels configured as twin stereo channels
	Range 9 octaves
Discs	Built in 3½ inch disc drive
	Capacity 880K formatted
Keyboard.	Detatchable 89-key with separate numeric pad
Mouse	Two-button – connects to joystick port
Input/output:	Twin joystick ports
	Supplementary disc port
	Centronics parallel printer port
	RS232C serial communications port
	Ram expansion (256K) port
	Stereo audio output
	Video TV RGB
	System Bus

Gridbase

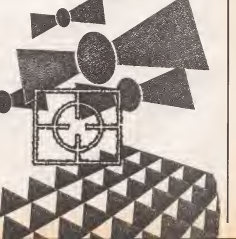
A treat for Dragon 32 arcade addicts – written by *Ashley Adamson and David Rush*

The game is set in space and is played on the high resolution screen with 3-D perspective and alien ships which grow as they close in to invade your Gridbase. There are also two opening screens as well and a closing title screen which gives the score. The game is quite user friendly and has plenty of arcade style sound effects. It requires the use of one joystick. There are five levels of difficulty.

The aim is for the player to defend their Gridbase from the waves of UFO's which are trying to pass your defences. For protection you have an on-screen target-sight for your laser which must be aligned carefully with your joystick over the weak spot in the centre of the UFO. On the highest difficulty level you must strike within one pixel of the weak spot to score a hit! Good luck!

Program Notes

Lines	Notes
10	Sends program in subroutine in 230
40	F is the counter for the hits
50-60	Selects random co-ordinates for UFO
70	Begin loop for UFO scaling up
80	Puts blank area (E) after target (T)
90-110	Calculates joystick target position
120-130	Scales up UFO
140-150	Checks fire button and sounds laser
160-190	Checks for a hit, increments score, returns to UFO scaling up
200-230	Draws "Game Over" in Hi-Res and waits
240-280	Final screen gives score and asks to play again
290-320	Waits for yes or no
330	Reserves space for target (T) and its blanking area (R)
340-370	Title screen
380	Rising music precedes game
390	Selects Hi Res screen
400	Draw string for alien UFO
410	Draw string for target
420	Target drawn centrally to start
430-440	Gets target (T) and blanking area (R) for putting in 80 and 110
450-460	Draws the Gridbase
490-510	Plots the stars
520-540	Sounds warning klaxxon and returns to begin game



```
10 GOSUB330
20 REM GRIDBASE
30 REM BY A R ADAMSON & D M BUSH
40 FOR F=1 TO 5
50 A$=STR$(RND(190)+30)
60 B$=STR$(RND(70)+30)
70 FOR I=1 TO 25
80 PUT(A,B)-(A+10,B+10),R,PSET
90 A=JOYSTK(0)*3.9:B=JOYSTK(1)*2
.25
100 IF B>105 THENB=105
110 PUT(A,B)-(A+10,B+10),T,PSET
120 S$="S"+STR$(I)
130 DRAWS$+"C1BM"+A$+","+B$+U$
140 P=PEEK(65280)
150 IF P=126 OR P=254 THEN PLAY"
V31;T255;L255;O3;BAGFEDC"
160 IF ABS(A+5-VAL(A$))<LE AND A
BS(B+5-VAL(B$))<LE AND (P=126 OR
 P=254)THEN PLAY"V31;T150;L10;O3
;GGCF#CF#CF#CF#CF#":H=H+1:F=F
+1:DRAWS$+"C0BM"+A$+","+B$+U$:IF
 F>5 THEN 200 ELSE 50
170 DRAWS$+"C0BM"+A$+","+B$+U$
180 NEXT I
190 NEXT F
200 COLOR1,1:LINE(97,92)-(159,98
),PRESET,BF
210 DRAW"S4BM102,93C0L4D4R4U2L2B
M+5,-2D4U4R4D2L3R3D2BM+3,+0U4F2E
2D4BM+7,+0L4U2R2L2U2R4"
220 DRAW"BM+10,+0R4D4L4U4BM+7,+0
D2F2E2U2BM+7,+0L4D2R2L2D2R4BM+3,
+0U4R4D2L3R2D1F1"
230 FOR DE=1 TO 1000:NEXT DE
240 CLS
250 PRINT@135,"YOU HIT"H"OUT OF 5"
260 FOR I=200 TO 20 STEP-20:SOUN
D I,1:NEXT I
270 PRINT@264,"WILL YOU DEFEND"
280 PRINT@326,"GRIDBASE AGAIN  Y
/N"
290 Q$=INKEY$:IF Q$="" THEN 290
300 IF Q$="Y" THEN RUN
310 IF Q$="N" THEN PRINT"BYE BYE
":END
320 GOTO290
330 DIMR(4),T(4)
340 CLS3:PRINT@11,"gridbase";
350 PRINT@224,STRING$(96,143);:P
RINT@256,"LEVEL(1-5...1 IS HARDE
ST)";:INPUTLE
360 IF LE<1 OR LE>5 THEN GOTO 350
370 CLS3:PRINT@64,CHR$(128):PRIN
T@76,"GRIDBASE":PRINT@95,CHR$(12
8):PRINT@192,CHR$(128):PRINT@199
,"ALERT ALERT ALERT":PRINT@223,C
HR$(128):PRINT@329,"HOSTILE ALIE
NS";:PRINT@363,"ON SCANNER";:PRI
NT@487,"USE RIGHT JOYSTICK";
380 FOR I=10 TO 200 STEP 5:SOUND
 I,1:NEXT I
390 PMODE 4,1:PCLS 0
400 U$="G1L1H1E1R1E1F1R1F1G1L1H1"
410 T$="R6D2BR2D6BL2BD2L6BU2BL2
U6"
420 DRAW"BM110,110C1XT$;"
430 GET(0,0)-(10,10),R,G
440 GET(108,110)-(118,120),T,G
450 PCLS0:LINE(0,120)-(255,120),
PSET
460 LINE(0,123)-(255,123),PSET:L
INE(0,128)-(255,128),PSET:LINE(0
,134)-(255,134),PSET:LINE(0,142)
-(255,142),PSET:LINE(0,152)-(255
,152),PSET:LINE(0,167)-(255,167)
,PSET
470 LINE(128,191)-(128,120),PSET
:LINE(70,191)-(115,120),PSET:LIN
E(185,191)-(141,120),PSET:LINE(2
0,191)-(95,120),PSET:LINE(236,19
1)-(162,120),PSET:LINE(0,167)-(7
0,120),PSET:LINE(255,167)-(187,1
20),PSET:LINE(0,142)-(47,120),PS
ET
480 LINE(255,142)-(210,120),PSET
:LINE(0,128)-(25,120),PSET:LINE(
255,128)-(232,120),PSET
490 FOR I=1 TO (RND(10)+40)
500 PSET(RND(255),RND(115),1)
510 NEXTI
520 FOR I=1 TO 3:SOUND 200,3:SOU
ND 100,3:NEXT I
530 SCREEN1,1
540 RETURN
```

Super-duper Basic

Part One of a powerful extension to ZX Basic brought to you by *Stuart Nicholls*

ZX! Basic is an extension to Spectrum Basic that allows all existing commands to be used and provides 28 new or improved commands. This is achieved on the standard 48K Spectrum and does not need the interface Shadow Rom. ZX! Basic commands are in the form:

!A———parameters———

!B———parameters———

That is, the capital letters A to Z are used preceded by a ! (exclamation mark)

All new commands are checked for syntax errors both on entry and in Run time in exactly the same way as normal Spectrum Basic. One result of this entry checking is that certain Spectrum Basic commands will not allow ZX! Basic commands to follow them, but all ZX! Basic commands will allow Spectrum Basic commands on the same line. In general if a line is correct but fails syntax then the part of the line that has failed syntax must be moved to a new line

The ZX! Basic screen is different to that of Spectrum Basic. For the two new print commands the top left hand corner of the screen is considered as 0,0, and the bottom right hand corner as 23,31, that is the *Edit* lines are part of the main screen and not just for *Input* commands

The new commands for plotting, ie, *!P*, *!D*, *!C*, *!N*, *!R* use a 256 × 256 pixel screen in which pixel 0,0 is the bottom left corner pixel (line 23) and 256, 191 is the top right hand corner. 'Y' co-ordinates between 192 and 255 are allowed but of course will be off the top of the TV screen. This is useful when lines are required to go off screen and then back on again

ZX! Basic is loaded as two sections and comprises approximately 7K bytes of code with a further 6.25K allocated to Sprite data (which includes a screen dump when animation is switched on)

To enter the machine code use the following simple Basic program which in fact has two functions

1. Goto 10 – prints on the screen a Hexdump of any area of memory in blocks of eight bytes with the Hex address of the first byte in the block and also prints a Checksum byte for the block calculated as the sum of the previous eight bytes 'mod. 256', that is the remainder of the sum Sum of 8 bytes/256

2. *Goto* 1000 – allows the input of blocks of eight Hex numbers and the Checksum byte (ie, a Hexloader). If any line is incorrectly entered then there is sufficient error trapping to detect this and give a suitable error message, the line can then be re-entered. Each input should consist of 18 characters except the last line which should contain a maximum of 18 characters including the end of dump marker "ZZ".

Using *Goto 1000* enter the codes as in Part I (printed this week and next). Firstly enter *Clear 51649*, then enter the codes in blocks of eight bytes, and the Checksum byte with no spaces between each code, the start address being 51650

When the code has been entered and the program terminated with the ZZ code (ie, the last line is 0000000000ZZ) then save it using *Save "part1" Code 51650,2100*

Once this has been saved and verified then move on to part 2 Hexdump (which will be printed in week three) and enter the code in the same way starting at address 59904. After entering the last line in the hexdump *2E3761b0313003E06* then enter ZZ on its own to terminate the program. Now save this code using *Save "part2" Code 59904,5464*

After verifying part 2, the two codes can be loaded back into the Spectrum and run using *Print Usr 62777*. You should now be able to work through the instructions checking that each one functions correctly. Should any problem occur then check your code using the Basic Hexdump program (use *Goto 10*); the easiest way to do this is to match the checksums at the end of each line

Should all this be more than your patience can stand, then tape copies of *ZX! Basic* can be obtained from myself for £3.00p. Just send your requirements to me at: 82 Lays Drive, Keynsham, Bristol BS18 2LE

Should you wish to re-enter Spectrum Basic then enter *New* (but remember to save any program in memory beforehand as this will reset the Spectrum). This will leave ZX! Basic in memory for later use. *ZX! Basic* leaves approximately 28K free for Basic programming. Now onto the instructions!

!As – (Animate)

This command is used to turn on or off the interrupt driven sprite routines. When turned on, the current screen is saved for use in erasing sprites and as such does not permit any further permanent printing to the screen, however attributes can be changed to redirect sprites. (This is discussed further in commands !F, !G, !H, !J, and !K)

!A0 turns off the routine, while *!A> 0* turns

```
HEXDUMP + HEXLOADER

  10 REM ************************
  20 REM A$ HEXDUMP+CHECKSUM A$
  30 REM ************************
  40 DEF FN C()=INT (X/256)
  50 DEF FN D()=X-FN C()*256
  60 DEF FN E()=INT (T/256)
  70 DEF FN F()=T-FN E()*256
  80 DEF FN A()=INT (Y/16)
  90 DEF FN B()=Y-FN A()*16
 100 DEF FN C$()=CHR$ (FN A()+48
+7*(FN A()>9))+CHR$ (FN B()+48+7
*(FN B()>9))
 110 PAPER 7: INK 0: CLS
 120 INPUT "From address (DECIMA
L) ";ST
 130 INPUT "To address (DECIMAL)
 ";END
 140 PAPER 7: INK 0: CLS
 150 FOR X=ST TO END STEP 8
 160 LET Y=FN C(): PRINT FN C$()
;
 170 LET Y=FN D(): PRINT FN C$()
 180 LET T=0
 190 FOR Z=0 TO 7
 200 IF X+Z>END THEN LET Z=8: G
O TO 240
 210 LET Y=PEEK (X+Z)
 220 LET T=T+Y
 230 PRINT FN C$();" ";
 240 NEXT Z
 250 LET Y=FN F(): PRINT "= ";FN
 C$()
 260 IF X+Z<=END THEN PRINT : N
EXT X
 270 PRINT " ZZ"
 280 STOP
 290
 300
1000 REM ************************
1010 REM $ HEX I/P WITH CHECK $
1020 REM ************************
1030 DEF FN G(A$,B)=CODE A$(B)-4
8-7*(CODE A$(B)>57)
1040 DEF FN H(A$)=16*FN G(A$,1)+
FN G(A$,2)
1050 PAPER 7: INK 0: CLS
1060 LET R$="0"
1070 INPUT "Start Address (DECIM
AL) ";ADR
1080 PAPER 7: INK 0: CLS
1090 INPUT "8 BYTES+CHK ";A$
1095 LET ST=ADR
1100 LET LEN=LEN A$: IF (INT (LE
N/2)*2<>LEN) THEN PRINT "Odd no
.of chrs. ";: GO TO 1330
1110 IF LEN=18 THEN GO TO 1130
1120 IF A$(LEN-1 TO )<>"ZZ" THEN
 PRINT "No 'ZZ' marker ";: GO T
O 1330
1130 FOR A=1 TO LEN-2: IF A$(A)<
"0" OR A$(A)>"F" THEN PRINT "In
valid chr. ";: GO TO 1330
1140 IF A$(A)<"A" AND A$(A)>"9"
THEN PRINT "Invalid chr. ";: GO
 TO 1330
1150 NEXT A
1160 LET X=ADR
1170 LET Y=FN C(): PRINT FN C$()
;
1180 LET Y=FN D(): PRINT FN C$()
1200 LET X=0
1210 FOR K=1 TO 8
1220 LET B$=A$( TO 2): LET A$=A$
(3 TO )
1230 IF B$="ZZ" THEN LET K=9: L
ET A$=R$: LET B$=A$: GO TO 1280
1240 PRINT B$;" ";
1250 LET P=FN H(B$)
1260 LET X=X+P
1270 POKE ADR,P: LET ADR=ADR+1
1280 NEXT K
1290 LET Y=FN D(): PRINT "= ";FN
 C$();"/";A$
1300 LET R$=A$
1310 IF Y=FN H(A$) THEN GO TO 1
350
1320 PRINT "Checksum ";
1330 PRINT "error - re enter": B
EEP .5,10: BEEP 1,5: LET ADR=ST
1340 GO TO 1090
1350 PRINT "OK": BEEP .1,40
1360 IF A$<>"ZZ" THEN GO TO 109
0
1370 PRINT "PROGRAM TERMINATED"
```

on the routine (Note if this is used as a direct command then be prepared for sprites in your listings!)

!Bx,y,xo,yo – Draw a box using the co-ordinates *x,y* and *xo,yo* as the two opposite corners of the box. This command uses the current colours For example, **10** *!B0,0,255,191*, **20** *Pause 0* will box the whole screen The *Pause 0* instruction being necessary to stop the report *'OK'* on the *Edit* lines.

!Cx,y,r, (Circle)

Draw a circle with centre *x, y* and radius *r* The values of *x* and *y* can be from 0 to 255, and *r* can be from 0 to 100 This command is many times faster than the Spectrum circle and allows part circles to be drawn without the *'Out of Screen'* error report.

!Dxo, yo - (Draw)

As with Spectrum Basic, this will draw a line from the current plotted pixel to that specified by x offset y offset However with this command the offset value can be off the screen and will wrap around as necessary Colours are supported as with Spectrum Draw Note that the current co-ordinates are taken as on the ZX! Basic grid

!E (Erase)

Erase all 24 lines using the current attributes. This is similar to *Cls* but does not reset the print position to 0,0.

!Fn, s, lo, l, c, b, f - (Format)

The first of the Sprite handling commands used to set up a Sprite prior to turning on that sprite (see !G)

There are 16 sprites available in ZX!Basic of which 15 are computer controlled the 16th being controlled from the keyboard using the cursor keys Each of these sprites has its own set of sprite attributes (sets up by !F) as follows:

n - sprite no, (1 to 16)

s - speed 0 to 255 (the lower the value the faster the sprite) use values 0 1, 3, 7, 16, 31, 63, 127 and 255 for smooth movement other values will give jerky movement

lo – line offset value 0 is no movement vertically, 1 is down, 255 is up

co – column offset horizontally, 1 is right, 255 is left.

l - start at line (0 to 23)

c - start at column (0 to 31)

b - value of screen attribute that will cause a bounce (0 to 255)

f - figure to be used for sprite (1 to 16)

ZX!Basic has 16 different figures that can be used or you may design your own figures using the ZX!Sprite Designer program to be printed later in the series All sprites move by character squares and can be any size from 1 pixel to 16×16 pixels Offset values control the initial movement of the sprites This will change on striking a barrier If no barrier is set up then the sprite will wrap around the screen.

!Gs, n - (Go)

Switches On/Off a sprite. Once a sprite has been formatted using !F then it can be put on the screen or taken off the screen with this command s is the sprite in question (1 to 16) and n turns it on/off (0 is off, > 0 is on)

!Hs, n - (Speed)

Changes the speed of a sprite The sprite can be on screen or off. *s* is the sprite in question. (1 to 16) and *n* the new speed value (see !F)

!Js,n – (Jump)

Changes the figure used for a sprite *s* is the sprite in question (1 to 16) and *n* is the new figure, (1 to 16)

!Ks,n – (Knock)

Changes the barrier value for a sprite *s* is the sprite in question (1 to 16) and *n* is the new screen attribute for barrier, (0 to 255)

!Ix,y,n - (In fill)

This command will paint any shape starting from co-ordinate *x,y* using colour as specified by attribute value *n*. Any shape however irregular can be filled quickly, but ensure that the shape is complete with no gaps for the 'fill' to escape through. The command has a Break routine built in 'just in case'.

For example, **10** *!C127,95,40* **20** *!I127,95,56* will draw a circle in the middle of the screen then fill it in black.

!L address,n – (ZX!Poke)

A special Poke instruction to allow the setting up of sprite figures The Spectrum Poke command will result in a parameter error report if attempts are made to *Poke* into addresses 51650 to 65359 Address between 51650 and 65359 and *n* has a value 0 to 255

Remember, to install ZX!Basic, use the hexloader printed this week to load the data that will be published over the following issues

Next week, more instructions and more data

```
ZX Spectrum 48K HEXDUMP
Part 1 ( CODE 51650,2100
C9C2  CD 14 23 F5 CD F3 F6 CD = 7E
C9CA  00 F0 F1 32 0F 5C ED 43 = 43
C9D2  7C CA C0 8F F0 C0 21 00 = C0
C9DA  00 22 7A CA ED 4B 7C CA = E4
C9E2  0C 79 A7 28 07 C5 CD DF = C9
C9EA  FD C1 20 F4 2B 21 01 01 = 0A
C9F2  22 78 CA ED 43 7C CA CD = A7
C9FA  E2 F6 ED 4B 7C CA 78 3C = 0A
CA02  FF C0 20 1F 47 C5 CB 0C = 9A
CA0A  FE C1 20 03 32 78 CA 18 = 77
CA12  12 7A 78 CA A7 28 0C C5 = 2E
CA1A  2A 7A CA 23 22 7A CA AF = A6
CA22  32 78 CA ED 4B 7C CA 79 = 6A
CA2A  3D FE FF 20 1F 47 C5 CB = 5A
CA32  0C FD C1 20 05 32 79 CA = 3C
CA3A  18 12 3A 79 CA A7 28 0C = 02
CA42  C5 2A 7A CA 23 22 7A CA = DC
CA4A  AF 32 79 CA ED 4B 7C CA = A2
CA52  0D 79 FE FF 20 0E C5 CD = 4D
CA5A  DC FE C1 20 96 C0 54 1F = 90
CA62  3E 02 CF 14 28 7A CA 7C = 07
CA6A  D5 C0 28 22 7A CA C1 E0 = 0C
CA72  42 7C CA C3 E2 C9 01 01 = F9
CA7A  03 07 78 74 21 17 C6 1E = 00
CA82  C1 C0 49 F3 D0 F5 0F 3E = C9
CA8A  AA 55 AA 55 A0 55 AA 55 = FC
CA92  AA 55 AA 55 00 00 00 00 = FE
CA9A  00 00 00 00 AA 55 AA 55 = FE
CAA2  FF 99 99 99 99 99 99 FF = 94
CAAA  00 66 66 66 66 66 66 00 = 49
CAB2  00 00 FF 99 99 FF 00 00 = 30
CABA  00 00 00 66 66 00 00 00 = CC
CAC2  00 00 66 FF FF 66 00 00 = CA
CACA  00 00 00 00 00 00 00 00 = 00
CAD2  00 22 22 22 22 00 22 00 = AA
CADA  00 55 55 00 00 00 00 00 = AA
CAE2  00 00 55 77 55 77 55 00 = E0
CAEA  00 22 77 66 33 77 22 00 = C0
CAF2  00 CC DD 72 44 99 33 00 = FB
CAFA  00 44 AA 44 DD AA DD 00 = 96
CB02  00 22 22 00 00 00 00 00 = 44
CB0A  00 22 44 44 44 44 22 00 = B4
CB12  00 22 11 11 11 11 22 00 = 00
CB1A  00 00 55 22 77 22 55 00 = 65
CB22  00 00 22 22 77 22 22 00 = FF
CB2A  00 00 00 00 00 22 44 00 = 66
CB32  00 00 00 00 77 00 00 00 = 77
CB3A  00 00 00 00 00 00 22 00 = 22
CB42  00 11 11 22 22 44 44 00 = EE
CB4A  00 33 55 55 55 55 66 00 = 5D
CB52  00 66 22 22 22 22 22 00 = 10
CB5A  00 22 55 11 22 44 77 00 = 65
CB62  00 77 11 22 11 11 66 00 = 32
CB6A  00 44 55 55 77 11 11 00 = 87
CB72  00 77 44 66 11 11 66 00 = A9
CB7A  00 33 44 66 55 55 22 00 = A9
CB82  00 77 11 11 22 44 44 00 = 43
CB8A  00 33 55 22 55 55 66 00 = 0A
CB92  00 22 55 55 33 11 66 00 = 76
CB9A  00 00 00 22 00 22 00 00 = 44
CBA2  00 00 00 22 00 22 44 00 = 69
CBAA  00 00 11 22 44 22 11 00 = AA
CBB2  00 00 00 77 00 77 00 00 = EE
CBBA  00 00 44 22 11 22 44 00 = DD
CBC2  00 22 55 11 22 00 22 00 = CC
CBCA  00 66 00 DD BB 00 77 00 = DA
CBD2  00 22 55 55 77 55 55 00 = E0
CBDA  00 66 55 66 55 55 66 00 = 31
CBE2  00 33 44 44 44 44 33 00 = 76
CBEA  00 66 55 55 55 55 66 00 = 20
CBF2  00 77 44 66 44 44 77 00 = 28
CBFA  00 77 44 66 44 44 44 00 = E0
CC02  00 33 44 44 55 55 33 00 = 70
CC0A  00 55 55 77 55 55 55 00 = 20
CC12  00 77 22 22 22 22 77 00 = 76
CC1A  00 11 11 11 11 11 66 00 = D5
CC22  00 55 55 66 55 55 55 00 = 0F
CC2A  00 44 44 44 44 44 77 00 = CB
CC32  00 55 77 77 55 55 55 00 = 42
CC3A  00 66 55 55 55 55 55 00 = 8F
CC42  00 22 55 55 55 55 22 00 = 98
CC4A  00 66 55 55 66 44 44 00 = FE
CC52  00 22 55 55 55 77 33 00 = C8
CC5A  00 66 55 55 66 55 55 00 = 20
CC62  00 33 44 22 11 11 66 00 = 21
CC6A  00 77 22 22 22 22 22 00 = 21
CC72  00 55 55 55 55 55 33 00 = DC
CC7A  00 55 55 55 55 55 22 00 = C8
CC82  00 55 55 55 77 77 55 00 = 42
CC8A  00 55 55 22 22 55 55 00 = 98
CC92  00 55 55 55 22 22 22 00 = 65
CC9A  00 77 11 22 22 44 77 00 = 07
CCA2  00 66 44 44 44 44 66 00 = DC
CCAA  00 44 44 22 22 11 11 00 = EE
CCB2  00 33 11 11 11 11 33 00 = AA
CCBA  00 22 77 22 22 22 22 00 = 21
CCC2  00 00 00 00 00 00 00 FF = FF
CCCA  00 33 44 66 22 44 77 00 = 0A
CCD2  00 00 66 11 77 55 77 00 = DA
CCDA  00 44 66 55 55 55 66 00 = 0F
CCE2  00 00 33 44 44 44 33 00 = 32
CCEA  00 11 33 55 55 55 33 00 = 76
CCF2  00 00 22 55 77 44 33 00 = 65
CCFA  00 11 22 77 22 22 22 00 = 10
CD02  00 00 33 55 55 55 33 66 = C8
CD0A  00 44 66 55 55 55 55 00 = FE
CD12  00 22 00 22 22 22 11 00 = 99
CD1A  00 22 00 22 22 22 22 44 = EE
CD22  00 44 55 66 66 55 55 00 = 8F
CD2A  00 22 22 22 22 22 11 00 = D0
CD32  00 00 55 77 77 55 55 00 = ED
CD3A  00 00 66 55 55 55 55 00 = DA
CD42  00 00 22 55 55 55 22 00 = 43
CD4A  00 00 66 55 55 55 66 44 = 0F
CD52  00 00 33 55 55 55 33 11 = 76
CD5A  00 00 33 44 44 44 44 00 = 43
CD62  00 00 33 44 22 11 66 00 = 10
CD6A  00 22 77 22 22 22 11 00 = 10
CD72  00 00 55 55 55 55 33 00 = 87
CD7A  00 00 55 55 55 55 22 00 = 78
CD82  00 00 55 55 77 77 55 00 = ED
CD8A  00 00 55 55 22 55 55 00 = 76
CD92  00 00 55 55 55 55 33 66 = ED
CD9A  00 00 77 11 22 44 77 00 = 65
CDA2  11 22 22 44 22 22 11 00 = E6
CDAA  00 22 22 22 22 22 00 00 = CC
```

In plain terms

Part Two of an input routine for QL users written by ***Jonathan Prestidge***

This week, an explanation of the input parameters, plus the rest of the Super Basic listing Next week, a short example of the command in action

[field] is used when you want data to be updated. If you make the *field* string the information to be updated, then that information will be displayed on the screen so that the user can change the parts he or she wants, or not as the case may be The information does not have to be already on file, you could put the default for the input here instead, which in the case of a date input, for instance, might be today's date

[ranges] is a string which holds the inclusive range of the input. If the information entered by the user is outside of this range then an error message will result, and the user will be able to correct the information. The *range* string has dual syntax, the first being between two ranges and has the form "*n* to *m*", where *n* is the smaller number or word/character, and *m* is the larger The second form is "*a,b,c,* ... *z*" where *a* to *z* are numbers or words/characters separated by commas (without spaces)

[qualifiers] is a string containing any qualifier/qualifiers needed A qualifier is an optional command which changes the way in which the routine interprets or displays the information input. For example, the qualifier "*0 = 0*" makes the routine display any zero characters as 'oh' characters So if you prefer the 'oh' to be used in the input, include this command in the *format* string You can use as many qualifiers as are available (see Table Two for full list) and in any order, as long as you make sure they're in the correct syntax as shown in Table One Two valid examples are

"With Quiet, No buffer, No SP"

"Default = '06-May-84' Counter, 0 = 0, Cursor = '*' "

You may notice in the first example I have used the word *With*. I've just included it so that it makes more sense – it is not actually necessary as you can see in the other example With qualifiers you can add your own personal look to the inputs – for instance, by using the *Back = 'x'* qualifier you could change the under line character (which is used to display the field) for one of your choice; perhaps a user graphic that you have defined.

Here are some examples of whole commands with descriptions

Input_At 10, 2, "£229 99", "2 2", " 99 To 100", "With 0 = 0" This inputs a price with a default of £2 20, allowing a range of 99p to £100, the initial display being £ 2 20

Input_At 0, 0, "? A99999 (a) ", "", "", "No Buff" This formats an input for a stock code, the display appearing as ? _______(_) The input has no field string or range check

When typing the program in, I should omit any unnecessary spaces and Rem statements as it will use up less Ram and run faster You can renumber the routine with out affecting its running It's probably best to merge the routine into your program instead of actually including it in every program.

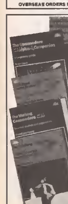
Table ONE Formatting characters

Char	meaning
A	Capital letters and spaces only
a	Lower case letters and spaces only
y	Upper case letters numbers & spaces only (alpha numeric)
x	Lower case letters and numbers only
M	Mixed case letters only
C	Any displayable characters
9	Numeric only A zero will be displayed in this position on entering the input
2	Leading numbers Any leading zeros in this position will be displayed as spaces
8	Trailing numbers Any trailing zeros in this position will be displayed as spaces
e	(small 'e') Mathematical symbols only, eg + - * / If an * is typed in in this position it will be changed to a computer style multiply sign ie '*' Decimal place If the user is entering a numeric field he or she can right justify their input before the decimal point and position the cursor just after the decimal point by pressing the fullstop key when this formatting character is used in the format string
6	Any symbol
1	This is a definable formatting character You define it by setting the variable USER1$ so that it contains all the characters allowed in this position See the main listing on line 1000 The variable must be set before the input is called yet can be set and reset as many times as required throughout you program
2	The same as '1' but uses USER2$ instead
3	The same as '1' but uses USER3$ instead Note that the example in line 1000 is set up as a HEX formatting character

Table Two Qualifiers

Qualifier	Min abrev	Function Of Qualifier
0 = O	0 = O	Makes zero appear as 'O
NO SPACES	NO SP	Allows no spaces in the input Ideal for key fields
NO BUFFER	NO BUFF	Clears key board buffer before input to cancels any type ahead code
WAKE UP	WAKE	Sounds a tone before the input Example to notify the user after long microdrive operations that the computer is ready for input
QUIET	QUIET	Disables the error tone (but not the WAKE UP tone)
COUNTER	COUNT	Displays the character pos be the side of the input (reset by CNTRL-F4)
GHOST CURSOR	none	Displays no cursor but makes the letter under the cursor flash
CURSOR = 'x	none	Makes the cursor character (which is normally an under line character) into character x
BACK = 'y	none	Makes the back-ground character (which is normally an under line character) into character y
DEFAULT = s'	none	where string s is the default for the input obtained when a blank field is entered by the user or CNTRL-F3 is pressed String s has to be the correct length ie that of the field

continued on page 23



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```
6120 LET ERR = "OK" : REMark Error flag
6130 IF CP = 1 THEN GO TO 6200
6140 IF I$ = " " AND INP$( CP - 1 )<> " " AND TYPE$( CP - 1 ) = "Z" THEN          LET ERR = "ERROR" : GO TO 6200
6150 IF INP$( CP - 1 ) <> " " THEN GO TO 6200
6160 FOR A = CP - 1 TO 1 STEP -1
6170   IF TYPE$( A ) <> "Z" THEN GO TO 6200
6180   IF INP$( A )  <> " " THEN LET ERR = "ERROR"
6190 NEXT A
6200 GO TO 5410
6210 REMark ============ Check and evaluate input before exiting ======
6220 LET STAT$ = "RETURN"
6230 IF I =  27 THEN STAT$ = "ESC"
6240 IF I = 232 THEN STAT$ = "F1"
6250 IF I = 236 THEN STAT$ = "F2"
6260 IF I = 240 THEN STAT$ = "F3"
6270 IF I = 244 THEN STAT$ = "F4"
6280 IF I = 248 THEN STAT$ = "F5"
6290 IF I = 208 THEN STAT$ = "UP"
6300 IF I = 216 THEN STAT$ = "DOWN"
6310 LET MARK2 = 1 : MARK = 0
6320 FOR A = MARK2 TO NUM
6330   IF TYPE$( A ) = "Z" OR TYPE$( A ) = "9" THEN MARK = A : GO TO 6360
6340 NEXT A
6350 GO TO 6430
6360 LET MARK3 = 0
6370 FOR A = MARK TO NUM
6380   IF INP$( A ) <> " " THEN LET MARK3 = 1
6390   IF MARK3 = 1 AND INP$( A ) = " " THEN IF TYPE$( A ) = "Z" OR              TYPE$( A ) = "9" THEN DISP_ERROR E$ &
                    "Disjointed Numbers not Allowed" : GO TO 5400
6400   IF TYPE$( A ) <> "Z" AND TYPE$( A ) <>"9" THEN LET MARK2 = A :           IF MARK2 < NUM THEN GO TO 6320
6410 NEXT A
6420 REMark ============ Out put strings ========================
6430 LET DE = "DEFAULT = "" INSTR QUAL$ :                                IF INP$ = FILL$( " ", NUM ) AND DE THEN LET INP$ =
                   QUAL$( DE + 11 TO DE + NUM + 10 )
6440 LET FUL_INP$ = TYPE$ : LET STR_INP$ = INP$
6450 FOR A = 1 TO NUM
6460   IF TYPE$( A ) INSTR ALLOWED$ THEN LET FUL_INP$( A ) = INP$( A )
6470   IF TYPE$( A ) =  "." THEN LET STR_INP$( A ) = "."
6480   AT LIN, COL + A - 1 :                                             IF TYPE$( A ) = "9" AND FUL_INP$( A ) = "0" THEN PR
INT ZERO$ :                ELSE PRINT FUL_INP$( A )
6490   IF NO_SPACES AND A > 2 AND A < NUM THEN                            IF INP$( A-1 )<>" " AND INP$( A+1 )<>" " AND IN
P$( A ) = " "                 THEN DISP_ERROR E$ & "No Spaces allowed in this field" :             GO TO 5410
6500 NEXT A
6510 FOR J = 1 TO NUM
6520   IF STR_INP$( J ) <> " " THEN GO TO 6540
6530 NEXT J
6540 FOR I = NUM TO 1 STEP -1
6550   IF STR_INP$( I ) <> " " THEN GO TO 6580
6580 NEXT I
```

Expert advice

Part Two of the Exsys expert system written by ***D F Murphy***

This week, the rest of the Basic listing, plus a step-by-step dummy run for you to follow.

R means press *Return* here. Firstly, *Load* and *Run EXSYS*. Then press *f1* input the name of the file, eg, "weather" R. For Variate one put *min T C*10* For Variate two input *max T C* R. Variate three *rain-mm.* R. For Variate four input *sun.hrs*10*, R. Variates 6 to 8 just R. This defaults to 0

Variates five to eight inclusive are not being used for this practice run. For 'result' input *tomorrow* as you are trying to find the probability of it raining tomorrow, given today s weather

Now press *f6*, input *day 1* under code, R Then input *94,R*. Then *11,R*. Then *18,R* and so on copying the figures on the sample data' sheet for the 'weather' file. (Fig one)

Note that to get the next row you will need to R again. The last column of the data should be ignored at this stage

The first column is the minimum temperature in degrees centigrade, *10 The second column is the maximum temperature, but this time rounded to the nearest degree, notice the need to round, or multiply, for integers The third column refers to rainfall in millimetres, and is rounded The fourth column is sunshine in hours, and is multiplied by 10 and rounded. (ie, 99 may be input, which means 9 9 hours of sunshine during that day, not 99)

When you get to columns 5 to 8 you can R to save time When you have finished each row of figures *Exsys* will provide a probability figure, which, initially, will not mean a thing!

This is because *Exsys* has no data in its results *known* file and simply refuses to give an estimate of probability higher than 1% Note that if p% was 0% then *Exsys* would be saying that the result is impossible

When you have input 15 rows of data you will be given a new page' just carry on as before Incidentally these pages are meant to be useful in certain circumstances.

You might decide for instance to use *Exsys* to predict the winner of a horse race, and it would be useful to put each race meeting on a separate page

You should on completion of this input session, have 30 rows of data. If you find yourself on a new page (page 3) and *Exsys* wants you to input data for row 31 then you pressed return once too many times. If this does happen then just R for each column This will upset the probability and system efficiency figures but it is only a practice run so don't worry about it.

Next press *f3*. You will be presented with the codes for each row and *Exsys* will be expecting input of either one or zero The last column of the 'Sample data' sheet gives the input.

'One' represents the fact it rained the following day, (ie, result true) and that it was dry, (ie, result false). You can check the data to verify it.

Press *f4* You will be asked which rule you wish to test Input '1' then R Then input '>', then R then input 40, then R.

Disregard what *Exsys* displays and press 'y' R Now press *f4* again and tell the system you want to test rule 2, inputting *< R, 12R.* Continue the process until you have input for rule 3, > 1, and for rule 4, < 98

Press *f5* Input the data on the forecast data sheet, in any order that you like, and this time the probability figures will mean something

An example of the forecast data is in Fig Two

If you don't want to go to the effort of typing the rather long listing in, I would be pleased to supply a copy of the program on tape for £3 Send it to me at Llanerch-y-Mor, Marianglas Anglesey, Gwynedd LL73 8PA

Fig 1

Exsys-Forcast Data-Filename>Weather

Page 1

1	day 1/2	81	11	2	38	0	0	0	0	99
2	2	40	12	4	58	0	0	0	0	99
3	3	32	12	1	89	0	0	0	0	11
4	4	28	13	0	83	0	0	0	0	11
5	5	35	12	0	56	0	0	0	0	11
6	6	31	11	0	22	0	0	0	0	1
7	7	78	9	1	6	0	0	0	0	1
8	8	56	9	3	16	0	0	0	0	99

Fig 2

Exsys-Sample Data-Filename>Weather

day 1	94	11	18	32	0	0	0	0	1
2	42	13	4	62	0	0	0	0	1
3	76	11	8	11	0	0	0	0	1
4	57	11	2	43	0	0	0	0	0
5	30	12	0	95	0	0	0	0	0
6	44	10	0	35	0	0	0	0	0
7	48	9	0	99	0	0	0	0	1
8	18	9	6	78	0	0	0	0	1
9	24	10	5	41	0	0	0	0	1
10	55	13	4	39	0	0	0	0	1
11	37	11	4	92	0	0	0	0	1
12	59	10	5	71	0	0	0	0	1
13	38	12	1	83	0	0	0	0	0
14	54	12	0	18	0	0	0	0	1
15	88	9	9	0	0	0	0	0	1
day 16	24	9	3	31	0	0	0	0	1
17	43	11	4	43	0	0	0	0	0
18	34	11	0	66	0	0	0	0	1
19	44	8	5	7	0	0	0	0	1
20	51	8	3	1	0	0	0	0	1
21	44	7	1	0	0	0	0	0	0
22	56	14	0	68	0	0	0	0	0
23	57	14	0	88	0	0	0	0	0
0	29	14	0	95	0	0	0	0	0
25	58	16	0	99	0	0	0	0	0
26	39	17	0	99	0	0	0	0	0
27	38	18	0	83	0	0	0	0	0
28	58	15	8	78	0	0	0	0	1
29	67	9	5	42	0	0	0	0	0
30	45	10	0	88	0	0	0	0	1

```
[illegible]
```





Working versions

One of the most annoying problems we have had in the column in the last few months has concerned the game *Monty Mole* – ever since I printed some *Pokes* that were sent in for extra lives, etc, which I had tested on my copy, I have been besieged by complaining letters from people who couldn't get them to work. It turns out that two versions of the game exist, one of which was owned by me and the people who sent in the original routines, and the other owned by just about everyone else in the world which had a headerless loader.

Anyway, to cut a long story short, Andrew Davies who you will remember for hacking the extra room in JSW wrote to me asking for a 'hacker's challenge' and after hearing of our problems with this game he writes, "I locked myself into the bedroom and set about finding a way to get around the long headerless block which some of the tapes have. The problem with this version is that every spare byte is used,so you don't have any spare space to put a normal routine in. To get round this my routine (fig A) loads *Monty* lower in memory than normal, poking the lives then moving the code back into its original position before running it. Just type this routine in, run it and follow the prompts. Unfortunately the loading screen is all messed up by the displaced code, but don't worry about that.

"The next listing is to get endless lives on Thor's *House Jack Built* – again follow the prompts (fig B).

"To get endless lives on Quicksilva's *Zombie Zombie* follow these instructions (fig C). A lot of the game is in Basic, which surprised me – when the main menu is up (red background and border) hold P down and press caps shift – you should get an input prompt. Rub out the quotes and type the keywords *Chr$ Usr* 4867 and press enter. You should now be in Basic with an OK message – DON'T list the program, just type in this line and then *Run*.

"Whilst on the subject of this game – you have the option to *Load* a city, but you don't get a chance to *Save* one until you have killed all the Zombies. For those that can't wait, the city is stored at address 48152 and is 18384 bytes long – filling these with the values 255 gives a completely packed city. I am working now on a city designer program and also a routine for saving the *Ant Attack* city to load it into *Zombie*, if anyone is interested.

"I have just bought *Jetset Willy II* which is better made than the original. It loads in one long headerless block like *Monty Mole*, but after cracking *Monty* it only took me five minutes to get into it."

Thanks for those tips Andrew, and we will look forward to seeing the JSWII pokes when ready.

Now then – a change of machine for a very important message. The routine for breaking into *Jetset Willy* in the Amstrad had a typing error in Vol 4 No 22. There needs to be ",AC" added to the end of the last Data statement in line 110. We had spotted this error and the idea was that the correct version would be printed in the Pokes special issue No 24. As life would have it the new version, despite being originally produced from a computer listing of the program, had a whole chunk missing from it – refer to issue 22 for the closest thing to a working version.

Sticking with the Amstrad for a while – Bill McMillan of Knottingly has written again. "Can one of your super-hackers help us with the much needed *Pokes* for *Chuckie Egg* or the brilliant game *Knight Lore*. I and my other CPC users are totally besotted with both of these games but are not proficient enough to advance very far. My personal best on *Chuckie Egg* is 42650 (level 38) but the wife is an expert." Well Bill, we are still waiting eagerly for the first person to crack *Knight Lore* on the CPC but as for *Chuckie Egg* – cop this from Tony Coxon of Calverton. "Use this to replace the Basic loader.

10 *Memory* 32767
20 *Load* "",32768
30 *Poke* 40175,255
40 *Call* 39575

"Also I have finished *Knight Lore* on this machine with 74%. Am I the first?" Sorry Tony, since you didn't date your achievement I don't know. However, David Litherland of Bolton finished with 87% and 26 days on 28th May. From the message that appeared on his game it looks as though Amstrad users as well as Spectrum owners will be able to look forward to *Mire Mare*.

To finish this week here are a couple of quick Dragon *Pokes* – from Shane Chessley of Midsomer Norton for *Chuckie Egg* – "*Cloadm*"",512 then replace tape – *Csavem*, "Chuckie", 13824, 3000, 16640. Reset computer. Load with *Cloadm*"", 65024. *Poke* 16641, &H34. *Poke* 16688, (lives),. *Exec* 16640." From John Martin of Upminster – *Donkey King* – *Poke* 12614,n where n is lives. Also after losing all your lives in *Dungeon Raid* press 'o' to continue."

Tony Kendle

Fig A

```
10 DATA 62,113,221,33,160,61,1
7,0,152,55,205,86,5,33,0,254,17,
0,64,1,30,0,237,176,195,0,64,49,
232,95,33,167,250,17,255,255,1,1
07,101,237,184,175,50,124,140,50
,125,140,50,126,140,195,144,210
  20 CLEAR 65535: FOR I=0 TO 53:
 READ a: POKE 65000+I,a: NEXT I
  25 PRINT PAPER 1; INK 5; "ENDL
ESS LIVES FOR 'MONTY MOLE' "
  30 PRINT : PRINT FLASH 1;"READ
Y": PRINT : PRINT "Wind original
 to just before the long headerle
ss part, then     press play an
d hit a key."
  40 IF INKEY$="" THEN GO TO 40
  50 PRINT : PRINT FLASH 1;"Here
 we go....please wait"
  60 RANDOMIZE USR 65000
```

Fig B

```
  10 CLEAR 24249: BORDER 1
  20 PRINT "Wind tape to just be
fore the    title screen, then p
ress any    letter."
  25 PAUSE 0
  30 POKE 23606,80: POKE 23607,2
48: LOAD ""CODE : LOAD ""CODE :
RANDOMIZE USR 24405: POKE 26828,
0: RANDOMIZE USR 26843
```

Fig C

```
2010 IF PEEK 46154<>0 THEN GO SU
B 1600: LET q=USR 33067: POKE 46
116,0: GO SUB 3100: POKE 46117,2
: POKE 46115,2: IF key=0 THEN RE
TURN
```

We are searching for the top UK computer games player – the best there is!

The very best of Britain's game players will get to fight it out on a number of top secret new games – scheduled for release in the autumn.

Here's how it works

Study the table below and look at the column for the machine you have – these are the games you'll need to master. Send your high scores in on the form below making sure that your scores are authenticated by a responsible individual signing the form. Any scores achieved using technical short-cuts – such as infinite lives Pokes – will not be accepted.

Between now and September Tony Kendle will be keeping you up to date on the *Arcade Avenue* top scores each week. Then, in September the top three scorers on each machine will be invited to a place in the final and the chance to be the first to play top secret games.

	Commodore	BBC	Spectrum	Amstrad
Game 1	Beetle Dragon	Gnu	Technician Ted	Sorcery
Game 2	Boulder Dash	Jet Pac	3D Star Strike	Splat!
Game 3	Shoot the Rapids	Chuckie Egg	Cyclone	Manic Miner

Game Wizard Entry Form

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Game 1 score ......

Game 2 score ......

Game 3 score: ......

Name ......

Address ......

Your signature ......

Witness's signature ......

Tony Bridge's Adventure Corner



Bored of the Rings

More letters from abroad this week, the first from Peter Martins from the lovely island of Cyprus "Dear Tony, this is the first time that I am writing for Help, and that is because I'm really desperate In *Bored of The Rings* – can you help me get out of the Old Forest? The game is terrific and the jokes are hilarious *Tir Na Nog* – What are the 'f' and the 'c' signs, how can you get past Nathair, where are the Antlers and the second half of the Torc I have roamed all over Lon Liath with the Spade, but I have still not found the Torc "

To deal with these problems in reverse order Peter – you'll find more information about *Tir Na Nog* in the Corner of 21-27 March 1985, so I suggest you look at that, which should explain some of the thinking behind the program. The 'f' sign, however indicates the Stone of Fal, while 's' is a pun (as most of the door names are) on 'Seaside = beach = sand' The Antlers are behind the 'O' (or Ring) door on the Plain of Lies. To get past Nathair (which will lead you to the fourth part of the Seal) is of course rather difficult, but you should probably be looking at ways of getting *behind* the Dragon As for *Bored of the Rings*, I'm glad to see that I am getting more questions about this one – now all I need is some information about it! I have done a little of the adventure, but not enough to answer this question.

Writing on the same subject, Charles Flynn ("I'm sorry that I don't have a butch nickname like Orc-Slayer, but there you have it!") accuses me of reducing him to a 5-stone insomniac, and all because I recommended this program – sorry, Charles, but I'm not going to suffer alone! "This game really is excellent, if Melbourne House need any help with *Lord of the Rings*, they should have a look at this Despite being a complete novice at adventures, I managed to complete the first of the three parts in around four hours, try dropping the pepper from Weatherwop at the gates of Morons – the effect is staggering (and also a free clue to MATC, says the Elf) However, Part Two is causing me sleepless nights How in Middle Earth do I get Fordo and his motley company out of Mororia? I have tried everything!" Obviously there is at least *one* thing that you have forgotten, Charles You may hold me responsible, but it is up to another reader to help you out I'm afraid Any help on *Bored* would be very welcome

Back overseas, Jose Pedro writes from Faro in Portugal He makes a point that is not always appreciated by those whose native language is English – that many players are not so lucky as to be able to negotiate all the subtleties of this weird language of ours In particular, Jose is having trouble with *Mountains of Ket* form Incentive Software "I can't cross the river – do I need to use the log, and if so, how? Also, what does TALPS mean?" There should be no problem in crossing the river, Jose The Log has nothing to do with this, you should chop them using the axe which you will have bought in the village Now give the logs to the Cartographer, or Map-maker, TALPS is the password that you will need at a later location, the Stairs A much-used device in adventures is the secret code word, which takes many forms (anagrams and so on), and this example is one of the most common Simply type the word *backwards*. It helps, of course, to be able to recognise quickly which form the code takes, and this particular word is a little unfair, I feel, to someone who may not know Incentive's past history – SPLAT is the name of their first game Still, this is a good object lesson, as weird words seen written on walls, or whispered by strange disembodied voices should be put to stringent decoding

Incidentally, Jose, let me give you another bit of inside information British adventurers will be well aware of a sweet called Polo It is a *mint with a hole* (hint, hint!) – this knowledge will be needed at a later stage of *Ket*

Jose is also playing *Valhalla*, *The Hulk*, *Tir Na Nog* and *Colditz* (what would you use to climb out of a window – the Rope of course! And you'll need the Hacksaw to open the Coffin) If you'd like to write to him, his address is Rua Ataide de Oliveira, No 97, 20 andar, sp.E 8000 Faro, Portugal

From a few miles north, from Cascais near Lisbon, writes Vasco de Oliveira, and he has some questions about *Eureka!* I still have not been able to get very far into this multiple-part adventure – the slowly-drawn graphics (though they are quite artistic, especially the animated pictures), the ceaseless 'music' whenever anything remotely unusual happens, those stupid 'arcade' sequences before each game and the frequent long silences while commands are processed go to make an adventure that is hard to play There is some atmosphere, certainly, as you might expect knowing that Ian Livingstone, author of a few million Role-Playing books, has written the storyline, but I find the programming does not do it justice and think all five adventures are like a steamed pudding – very sticky, very stodgy and very hard going

"In *Roman Times*, how do I enter the Army Camp, and what must I do there? In *Modern Caribbean*, I can't get out of the Ore Crusher In the Uranium Mine, I don't seem to have the object to use Is the plane important? Can we enter the doors? Finally, one other question – can you advise me about other adventure magazines, since *MicroAdventurer* disappeared?"

To get into the Army Camp, you must simply wait until nightfall, and this takes just one move (type Wait) This is a good idea in many adventures – if something doesn't work first time, try waiting around! Once in, you'll find some interesting items in the Tents, though they may be hidden from immediate view Waiting also pays dividends in the Crusher – if you wait until the roof is just 18 inches from your head, then Use Pump and then, at the earliest opportunity, Jump, you should find yourself out of immediate trouble In the mines draw a little map (a good idea in any adventure, of course) and then progress clockwise The plane is near the start, but the climax of this section will take place here

There are I'm sorry to say, no other adventure magazines published now that MAD has gone, although as you'll know, most micro computing magazines include an adventure column such as this You should try contributing to a reputable Adventure Club (see the Corner of a couple of weeks ago for addresses), you'll find most of them have a good in-house magazine

If you want to chat to a Portugese adventurer, write to Vasco at Rua Joao de Moura, 52, 2750 Cascais, Portugal

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SINCLAIR 48K Spectrum DK Tronics Keyboard Joystick Interface s/w mags £170 Tel 0922 812081 after 4pm

SELL SPECTRUM BETA Basic V18 for £6 Write to A. M Scott 30 Talbot Street Grangemouth FK3 8HU

SPECTRUM Software for sale All original includes Knight Lore Alien 8 Project Future and 90 more titles all very cheap prices from only £1 Tel Auburbe d X 760150 (evenings)

SPECTRUM Originals for sale Kong Swordfight Schizoids Softalk 1 Rodents Digger Dan Snooker Jungle Trouble Everest Ascent Missile Defence £3 each £25 the lot. J Monk Highlands Blue Boys Park Minchinhampton Glos

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SPECTRUM 48K in Lo Profile keyboard plus £400 worth of s/w plus tape recorder plus joystick and interface Worth £658 will sell for £199 ono Telephone Woking 25786

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BARGAIN SPECTRUM 48K + over £800 soft and hardware Matchday Knight Lore Baseball Currah Speech Interface 2 Five joysticks £250 Contact Marc Harris 9 Ardmore Gardens Drymen Glasgow G63 0BD

SINCLAIR QL 6 months old Excellent condition still boxed £290 Tel Stone 817591

SINCLAIR QL Micro Monitor 6 months old (Monitor) cost £300 sell £150 Excellent. Tel Stone 817591

QL VERSION II s/w Psion Chess many MDV carts leads etc Loads of listings/programs new car forces sale! Accept £250 Tel Ian on Brentwood (0277) 222084

SPECTRUM PLUS boxed with guarantee software pack 13 games Turbo joystick interface £219 sell for £170 Tel 01-462 5258 offers invited

48K SPECTRUM Interface plus joystick £60 s/w including Band Aid Fighter Pilot most ultimate games plus other software sell for £150 Tel Mark, 0642 716341

SPECTRUM SOFTWARE All originals Kong £2.75 Penetrator £2.75 Mr Wimpy £2.95 Meteor Storm £1.75 Life Expectancy £2.75 Converter £2.75 The lot for £14 Tel Kings Langley 66601

SPECTRUM 48K (complete with manuals PSV etc) cassette recorder Currah Microspeech 2 joysticks Hardware programmable interface sound amplifier ZX Printer £130 s/w plus complete mains plus system £175 Tel 01-608 4044

SPECTRUM GAMES Sherlock White Lightning £7.50 each Write to Neil Varden, 90 Homefield Lane Syston Leicester LE7 7NE

48K SPECTRUM in DK Tronics Keyboard good working order £75 Apply Mr Shafts 103 St Lukes Road, Southend SS2 4AE

SPECTRUM PLUS under guarantee £90 ono Also s/w 50 tapes £70 Will split, SAE for lists Sinclair Printer £25 A. McKelvie Flat 17 8 Courtfield Gdns, London SW5 Tel 01 370 4858

SINCLAIR PRINTER to sell £30 ono Near new two rolls used only might swap Rom Turbo plus Quickshot I we

SWAP 16K ZX81 with software for a working good condition Currah Microspeech (Spectrum) Tel Richard after 4pm or w/ends (0252) 877568

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PORTABLE computer Tandy 100 24K Ram c/w with built-in s/w LCD Batt/AC plus Acoustic coupler Modem for Telecom AC/ADP printer cable £350 also printer Spec/Drag compatible £30 Tel 0742 471180

APPLE II computer + 2 disc drives I Microdrive printer + monitor £1,500 Tel 01 606 3178

PORTABLE Computer Tandy model 100 plus AC/ADP manual case printer cable Some software 24K ram £480 Tel 0742 471180 after 7pm

TI 99/4A with Parsec and Invaders mod uses only £60 ono Tel 0472 822955 (Grimsby) any time

Wanted

WANTED Cheetah Rat will buy or swap Cambridge programmable interface David Tel Radlett 2877

SWAP Durst C35 colour enlarger and dark room equipment plus 100 watt amplifier for Amstrad disc drive or any reasonable offer Tel 0733 267978.

SWAP 48K SPECTRUM tape recorder joystick and interface £170 of original software for Atari 300XL, some games tape recorder and/or disk drive Darton Tel 0674 78678 weekends

Charts

Amstrad

1	(3)	Dun Darach	(Gargoyle)	£9.95
2	(1)	Beachead	(Access/US Gold)	£9.95
3	(4)	Alien 8	(Ultimate)	£9.95
4	(2)	Knight Lore	(Ultimate)	£9.95
5	(5)	Rocky Horror Show	(CRL)	£8.95
6	(–)	Red Moon	(Level 9)	£6.95
7	(6)	Mini Office	(Database Publications)	£5.95
8	(7)	Minter	(DK'Tronics)	£9.95
9	(9)	Sorcery	(Virgin)	£8.95
10	(–)	Snooker	(Amsoft)	£8.95

Bubblers:

Ghettoblaster	(Virgin)	£8.95
Pool	(Amsoft)	£8.95

Atari

1	(3)	Airwolf	(Elite)	£8.95
2	(–)	Bounty Bob Strikes Back	(US Gold)	£9.95
3	(1)	Drop Zone	(Microprose/US Gold)	£9.95
4	(2)	Archon	(Ariolasoft)	£11.95
5	(4)	Miner 2049 er	(Big 5)	£9.95
6	(6)	Hard Hat Mack	(Ariolasoft)	£9.95
7	(8)	Bruce Lee	(Datasoft/US Gold)	£7.95
8	(5)	Colour Space	(Llamasoft)	£7.50
9	(7)	Mule	(Ariolasoft)	£14.95
10	(9)	Decathlon	(Activision)	£9.95

Bubblers:

Ghostbusters	(Activision)	£14.95
Kissin Cousins	(English Software)	£8.95

BBC

1	(1)	Revs	(Acornsoft)	£14.95
2	(2)	Alien 8	(Ultimate)	£9.95
3	(4)	Repton	(Superior)	£9.95
4	(3)	Atic Atac	(Ultimate)	£7.95
5	(8)	Magic Mushrooms	(Acornsoft)	£12.95
6	(6)	Confuzion	(Incentive)	£6.95
7	(9)	Knight Lore	(Ultimate)	£9.95
8	(7)	Elite	(Acornsoft)	£12.95
9	(10)	Wizardore	(Imagine)	£7.95
10	(5)	Lode Runner	(Software Projects)	£9.95

Bubblers:

Mini Office	(Database Publications)	£5.95
Football Manager	(Addictive)	£7.95

Commodore 64

1	(1)	Way of the Exploding Fist	(Melbourne House)	£9.95
2	(2)	Elite	(Firebird/Acornsoft)	£14.95
3	(–)	Hypersports	(Imagine)	£7.95
4	(4)	Shadowfire	(Beyond)	£9.95
5	(3)	Dambusters	(Sydney/US Gold)	£9.95
6	(5)	Soft Aid	(Various Artists)	£4.99
7	(–)	Nick Faldo's Golf	(Mind Games)	£9.95
8	(9)	International Tennis	(Commodore)	£5.99
9	(7)	Pitstop II	(Epyx/US Gold)	£9.95
10	(8)	View to a Kill	(Domark)	£10.99

Bubblers:

Thing on a Spring	(Gremlin)	£7.95
Fourth Protocol	(Hutchinson)	£14.95

Spectrum

1	(1)	Hypersports	(Imagine)	£7.95
2	(–)	Frank Bruno's Boxing	(Elite)	£6.95
3	(7)	Jet Set Willy 2	(Software Projects)	£6.95
4	(9)	Glass	(Quicksilva)	£7.95
5	(5)	Shadowfire	(Beyond)	£9.95
6	(2)	Rocco	(Gremlin Graphics)	£7.95
7	(6)	Soft Aid	(Various Artists)	£4.99
8	(4)	Spy vs Spy	(Beyond)	£9.95
9	(7)	Nodes of Yesod	(Odin)	£9.95
10	(–)	Dynamite Dan	(Mirrorsoft)	£6.95

Bubblers:

Monopoly	(Leisure Genius)	£9.95
Fourth Protocol	(Hutchinson)	£14.95

All figures compiled by Ram/C

Top Twenty

1	(2)	Way of the Exploding Fist *(C64)*	Melbourne Hoiuse
2	(3)	Hypersports *(Spectrum/C64)*	Imagine
3	(1)	Elite *(C64/BBC/Electron)*	Firebird/Acornsoft
4	(–)	Frank Bruno's Boxing *(Spectrum)*	Elite
5	(4)	Soft Aid *(Spectrum/C64)*	Various Artists
6	(5)	Jet Set Willy 2 *(Spectrum/C64)*	Software Projects
7	(10)	Glass *(Spectrum)*	Quicksilva
8	(8)	View to a Kill *(Spectrum/C64)*	Domark
9	(9)	Spy vs Spy *(Spectrum/C64)*	Beyond
10	(11)	Cauldron *(Spectrum/C64)*	Palace
11	(10)	Dambusters *(C64)*	Sydney/US Gold
12	(12)	Shadowfire *(Spectrum/C64)*	Beyond
13	(7)	Rocco *(Spectrum)*	Gremlin
14	(6)	Dun Darach *(Spectrum/Amstrad)*	Gargoyle
15	(15)	Alien 8 *(Spectrum/BBC/Amstrad)*	Ultimate
16	(14)	Revs *(BBC)*	Acornsoft
17	(13)	Nodes of Yesod *(Spectrum)*	Odin
18	(17)	Herbert's Dummy Run *(Spectrum/C64/Amstrad)*	Mikro-Gen
19	(16)	Rocky Horror Show *(Spectrum/C64/Amstrad)*	CRL
20	(19)	Knight Lore *(Spectrum/BBC/Amstrad)*	Ultimate

Figures compiled by Ram/C

Readers' Chart No 35

1	(2)	Soft Aid (Spectrum/C64)	Various Artists
2	(1)	Elite (C64/BBC/Electron)	Firebird/Acornsoft
3	(6)	Dun Darach (Spectrum/Amstrad)	Gargoyle
4	(8)	Shadowfire (Spectrum/C64)	Beyond
5	(3)	Spy vs Spy (Spectrum/C64)	Beyond
6	(7)	Confuzion (Spectrum/Amstrad/C64/BBC/Electron)	Incentive
7	(–)	Hypersports (Spectrum)	Imagine
8=	(4)	Knight Lore (Spectrum/BBC/Amstrad)	Ultimate
=	(–)	View To A Kill (Spectrum/C64)	Domark
10	(–)	Revs (BBC)	Acornsoft

Winning phrase No 35. "Neil talks to the fridge" from A Houston of Falkirk, who receives £25. Others who came close include "Frankie goes to the till" from Rob Strudwick of London NW5.

Now voting on week 37 – £25 to win

Each week *Popular* is compiling its own special software top ten chart – compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes the most original (witty, neat or clever – but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's chart, published above.

You can still vote in the chart without making up a slogan – but you won't be in with a chance of winning the prize.

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to. Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

Voting for Week 37 closes at 2pm on Wednesday August 7 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

Name ....

Address ....

....

....

My top 3: Voting Week 37

1..

2..

3..

My phrase is: ....

New Releases

AUTHENTIC

April Showers is an arcade game from Bevan Technology who are a company new to me and strangely have issued a batch of five Electron/BBC games

April Showers falls firmly into the category of 'cute' since its plot consists of a) being a cloud b) collecting water c) raining on budding vegetation, threat takes the form of umbrellas that waft about the sky As you can see Rambo it's not

The graphics are better than average – the cloud has little eyes that roll about and as you water the plant it grows in authentic fashion. It even hangs together in a slow, gentle way as a game – though it can't honestly be said to raise the adrenalin touch. As a program for younger children it may have some fans, personally I think it would have made a good cheapie at £2 50 or so

Program *April Showers*
Price *£7 95*
Micro *BBC*
Supplier *Bevan Technology Gresham Chambers 14 Lichfield Street Wolverhampton West Midlands WV1 1DG*



ZAPPED

I'm sure we all remember *Boulderdash*, (a distant relation to *Mr Do*) which when released last year by Statesoft gained a select – albeit rather small – following

Well now, those particular addicts can queue up for a second helping of the same, in the shape of *Rockford's Riot*, from Monolith

As in *Boulderdash*, you tunnel your endearing (and unpatient) sprite through various caves, collecting and sometimes creating, jewels – a number of which you must collect before exiting the cave via a magic door – all within a strict time limit. Death will occur if you are crushed by falling rocks or jewels or zapped by fireflies

Perhaps the game's best feature is its long lasting playability The 16 screens are arranged in four groups of four, and you can start the game on the first screen of any group Combine this with the fact that there are five levels of difficulty and you get endless permutations of play

Although there are extra features here, *Rockford's Riot* isn't going to convert anyone who didn't like the original (added as a freebie on Side Two of the tape by the way)

And how the hell are those funny shaped cassette boxes going to fit on the shelves of WH Smiths?

Program *Rockford's Riot*
Price *£9 95*
Micro *CBM 64*
Supplier *Monolith Lector Court 161 Farringdon Road London EC1*

Pick of the week

EXAMINE BRAIN



Mad Doctor is one of the most entertaining Commodore 64 arcade games I've seen in a long while Not only is it ingenious, inventive and compulsive it's also ghoulishly funny

Try this for a plot you are a mad doctor and to prove your mad genius to an indifferent world, seek to create a monster in human likeness To create this monster it so happens that a few villagers will have to be sacrificed for spare bodily parts and you'll also need a few other objects as well, most importantly a bolt (Can you imagine any self respecting monster without one? I mean, without a bolt it'd be unhinged)

The game has (kind of) 3D graphics, in that you appear to walk into the screen and uses a joystick controlled menu system to make choices like Prepare Body, Examine Brain, etc The game consists of finding the key ingredients and bashing unsuspecting villagers to death and carting off their bodies for inspection Not just any villager though you need to choose the parts carefully, lest your final monster prove unsound by, for example, beating you to death.

All the villagers wander around according to set patterns as the day moves on. Anyone you kill will, at some point, be missed and people will come looking for him or her More generally, as people start to disappear from the village, other inhabitants get more suspicious, making your life more difficult and making it harder to knock off more spare parts

Although the characters are fairly small generally the graphics are very effective This is definitely one of the more original games around at the moment Hide it from impressionable parents

Program *Mad Doctor*
Price *£8 95*
Micro *Commodore 64*
Supplier *Creative Sparks Thompson House 296 Farnborough Road Farnborough Hampshire GU14 7NF*

This Week

Program	Type	Micro	Price	Supplier
Chiller	Arc	Amstrad	£1.99	Mastertronic
Locomotion	Arc	Amstrad	£1 95	Mastertronic
Airwolf	Arc	Amstrad	£8 95	Amsoft
Finders Keepers	Arc	Amstrad	£1.98	Mastertronic
Boulder Dash	Arc	Amstrad	£8 95	Mirrorsoft
Nonterraqueous	Arc	Amstrad	£1.99	Mastertronic
Alien	S	Amstrad	£8.95	Amsoft
Grand Prix Rally II	S	Amstrad	£8 95	Amsoft
Amstra Draw	Ut	Amstrad	£12 95	Amstra Draw
Transact	Ut	Amstrad	£8 95	Amsoft
Boulder Dash	Arc	Atari	£8 95	Mirrorsoft
Ashatron	Arc	BBC	£7 95	Bevan Technology
April Showers	Arc	BBC	£7 95	Bevan Technology
Boffin	Arc	BBC	£9 95	Addictive
Mayday	Arc	BBC	£7 95	Bevan Technology
Digital Defender	Ed	BBC	£7.95	Bevan Technology
Mad Doctor	Arc	Commodore 64	£8 95	Creative Sparks
Mig Alley Ace	Arc	Commodore 64	£9 95	Centre Soft
Whurlinurd	Arc	Commodore 64	£6 95	Centre Soft
Chicken Run	Ad	Dragon	£2 95	Impsoft
Fruity	Ad	Dragon	£2 95	Impsoft
Tournament Snooker	S	Einstein	£14 95	Hard Software
Mordon s Quest	Ad	Enterprise	£7.95	Enterprise
Red Moon	Ad	Enterprise	£6 95	Level 9
First Steps w Mr Men	Ed	MSX	£8 95	Mirrorsoft

New Releases

LAYERED

Popeye the computer game has been imminent for ages now – DK'Tronics seem to have been tinkering with it for a year or more. Now it is here

The first thing you notice about the game is that the graphics are very large and cartoon like, more so than any other Spectrum game I know – this is a definite plus On the other hand, to begin with at least, playing the game is terribly confusing Whilst the controls, up, down, left, right, sound reassuringly simple, in practice they have a variety of different functions according to location For one thing, there are 'layers' of back ground ie if you see a window you may appear either behind or in front of it according to which layer' you have entered In this context, the up and down keys sometimes mean forward and backwards, similarly they may on occasion mean up and down rope

You do get somewhat used to it but it remained an irritant Another problem is that, perhaps because of the big sprites, everything happens slowly This also serves to reduce the tension somewhat and detract from the game

Nevertheless the graphics, particularly the way they almost totally avoid colour resolution problems, are very impressive and you do some what get the hang of the game after a while The plot is the bog standard collect the (hearts) and dodge the (vultures, Brutus and other less easily described objects) format.

At £5 95 it's reasonably priced and certainly worth persuading someone else to buy so that you can look at it. I think that probably younger arcade addicts will be most impressed.

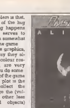
Program *Popeye*
Price *£5.95*
Micro *Spectrum*
Supplier *DK'Tronics*
Unit 8
Shire Hill Industrial Estate
Saffron Walden
Essex
CB11 3AQ



INVADED

Alien was, retrospectively, a much underrated game – tremendously difficult to get into and lacking spectacular graphics, it got criticised and reviewers missed the subtlety of the plot and the generation of real tension.

There is a chance to look at it afresh with the latest conversion of the game to the Amstrad. The program remains the same, although the packaging has shrunk to include a booklet that fits in a



normal size cassette box.

The game requires strategy more than anything else Your spaceship Nostromo has been invaded by an Alien, actually 'invaded' is hardly the word Pick your own term for 'to spew viciously from John Hurt's stomach' Somehow you have to get rid of it – either by forcing it out of the spaceship or by getting all the crew safely off the spaceship and setting it to auto destruct complete with alien.

The game uses a series of menus through which you control the movements of the members of the crew and instruct them to pick up and use any useful objects that might be lying around. Occasionally crew members may report that grilles have been removed, evidence that the nasty is crawling around nearby

Alien also features that nebulous and usually fraudulent computer game concept, 'independent characters', this means roughly that, sometimes crew members will not do as they are told, eg, if they are cowardly and think they're likely to get slurped

Alien is really a very ingenious game and should particularly appeal to wargamers who won't be put off by the relatively primitive graphics.

Program *Alien*
Price *£7 95*
Micro *Amstrad*
Supplier *Amsoft*
Brentwood House
169 Kings Road
Brentwood
CM14 4FF

UNGAINLY

US Gold is shortly to launch more titles for the Commodore 64 Winner of most bizarre title this week is *Whurlinurd*, a game with wackiness seeping out of every corner The main game character is a nurd (foolish, gewky, ungainly, utterly uncool, usually male) with helicopter rotors on his head

Your nurd can fly around bouncing up and down and has to eat a variety of wacky objects, getting to them only by negotiating a host of wacky obstacles The graphics won't astound anybody except in terms of their oddness the sound effects, though, are entertaining

This would be a game with some fans at £5 or £6, but at the standard US Gold price of £9 95 it isn't really special enough.

Program *Whurlinurds*
Price *£9 95*
Micro *Commodore 64*
Supplier *US Gold*
Unit 10
The Parkway
Industrial Estate
Heneage Street
Birmingham

This Week

Starseeker	Ed	MSX	£9.95	Mirrorsoft
Popeye	Arc	Spectrum	£5 95	DK Tronics

Key **Ad** – adventure **S** – strategy-simulation
Arc – arcade **Ut** – Utility
Ed – education

Addictive 7A Richmond Hill Bournemouth BH2 6HE 0202 296404 **Amsoft** Brentwood House 169 Kings Road, Brentwood, Essex, 0277 230222 **Amsira** Draw, 1 Cowleaze, Chinnor, Oxford OX9 4TD 0844 52426 **Beven** Technology Gresham Chambers 14 Litchfield Street Wolverhampton W1 1DG **Centre Soft** Unit 10 Parkway Industrial Centre Heneage STreet, Birmingham, 021 359 **Creative Sparks** Thompson House 296 Farnborough Rd Farnborough Hants 0252 543333 **DK Tronics** Unit 2 Shire Hill Industrial Estate Saffron Waldon Essex, 0799 26350 **Enterprise** 31 37 Hoxton Street, London N1 6NJ 01-739 4282 **Hard Software** 6 Drum Way Leicester LE3 6NB, 0533 873247 **Impsoft** 149 Balham Hill London SW12, 01-675 5577 **Level 9** 229 Hughenden Road High Wycombe Bucks HP13 5PG 0494 26871 **Mastertronic** Park Lorne 111 Park Road London NW8 7JL 01-402 3316 **Mirrorsoft** Mirror Group, Holborn Circus London EC1P 1DQ 01-353 0246



In the future

Has anybody actually thought of a sensible use for Compact Disc Rom players?

An awful lot of people are putting an awful lot of time and money into CD Rom technology, and it seems to me that they are trying to write the future of micros before reading the present

I read in a magazine that "compact disc players look set to make a significant impact in the micro world" and "the market is forecast to reach half a billion dollars in five years" Enthusiastic as these statements are, I feel that CD Roms have been tremendously over-hyped. While they do have massive storage capabilities and fast access times, they are Roms and as such their applications are extremely limited.

Putting *Encyclopedia Britannica* on CD and putting a copy in every library is not exactly a massive market Anyway, it's cheaper to buy a copy of *Britannica* than the computers to run it on, and there is less maintenance

Well under half of the home users in Britain have a disc drive (costing at least £200) so who is going to spend £450 on an inflexible CD player before they buy a disc drive?

Sales of Rom based software and utilities are notoriously low Look at the Interface 2 at only £20 and £15 for a Rom. After the initial launch nobody took it up If they don't want relatively cheap Roms (people wince at £60 for Maxam on the Amstrad), what chance do you have of selling extremely expensive CD's

It is said that hardware manufacturers are pushing CD Roms because they are not copyable A far more sensible way of stopping copying is the Eprom cartridge (You remember? – Having a master terminal in the shops that programmed your Eprom with your choice of game which you then took home and plugged in to your machine The one that two years ago every one said would make the cassette game obsolete by 1985!)

Manufacturers seem to be shying away for this – new computers don't seem to have cartridge slots any more Perhaps they feal that all that re-usable hardware wouldn't be as profitable

As to the idea of very large adventure programs, I have yet to see an adventure with the 160K of object code that it would take to fill a 5¼" or 3" disc The market of disc owning adventurers is not yet big enough for programs to be written to disc sizes, so they are still just another medium for cassette sized software As discs haven't reached that point yet, I hardly think CDs are ever likely to

Admittedly, the possibilities of masses of pictures loading instantly off CD in adventures sounds nice, but in such an adventure, with at the very least 200 locations, who's going to pay for 200 high-res full screen pictures?

Software is never going to reach the sort of sizes that a Sony 3½" drive cannot cope with (500K) and that costs less than a CD and can be written to

"Write Once" CDs have also been suggested These would have a use as compact permanent archival storage for large companies, but not in the home micro scene

So CDs only use is for massive databases How many massive collections of information that never change (remember you can't write) does the average person in the street need, let alone want, or is prepared to pay £480 for? Certainly not bank accounts, or letter writing, or stamp collections Not even the last three million years football results for the pools prediction program, after all, it would be out of date in a week! Hardly a $500,000,000 business Information that does not change is history, and I doubt that all the historians in the world have that much money!

Michael Fox

Exclusive primes

Puzzle No 168

Professor Otto Hex was in a state of great excitement. 'At last,' he exclaimed 'I have found that mystic secret that mathematicians have been seeking for centuries – a formula for generating exclusively prime numbers! Indeed such a thing, should one exist, would bring fame if not exactly fortune to its lucky discoverer

Professor Hex had been studying a table of prime numbers and had noticed that 31, 331 and 3331 were all prime This led him to further experiment and he soon found that 33331, 333331, and 3333331 were prime also

"By repeating this procedure of adding an extra '3' to the left of each preceding number we can generate an endless series of primes

Unfortunately, this was not the first time that such a rash statement had been made, nor was it the first time that such a statement had been shot down in flames To save Professor Hex any further embarrassment, can you find the lowest of these 'Hex' primes that is, in fact, composite?

Solution to Puzzle No 164

Apart from the two examples given in the question (2500 and 7600) the only other four-digit number that regenerates is 3792

```
10 FOR N=1000 TO 9999
20 LET SQ=N*N
30 LET SQ$=STR$(SQ)
40 IF LEN(SQ$)<8 THEN SQ$="0"+SQ$: GOTO 40
50 LET Z$=MID$(SQ$,3,4)
60 LET Z=VAL(Z$)
70 IF Z=N THEN PRINT Z
80 NEXT N
```

The program works by squaring in sequence all four-digit numbers Those which produce a seven-digit square are prefixed by a zero

By using the *Mid$* function, the middle four digits are extracted from the squares as produced and compared with the original number

Winner of Puzzle 164

The winner is Nick Weatherhead of Hulcott Aylesbury who receives £10

Rules

The closing date for Puzzle 168 is August 28

The Hackers




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..And you thought
you'd seen a Karate game
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is the only accepted standard, so play nothing
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